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N. P. STEVENS.

Improvement in Machines for Facing the Ends of Tubes  
and Hollow Cylinders.

No. 122,921.

Patented Jan. 23, 1872.

Fig. 1.

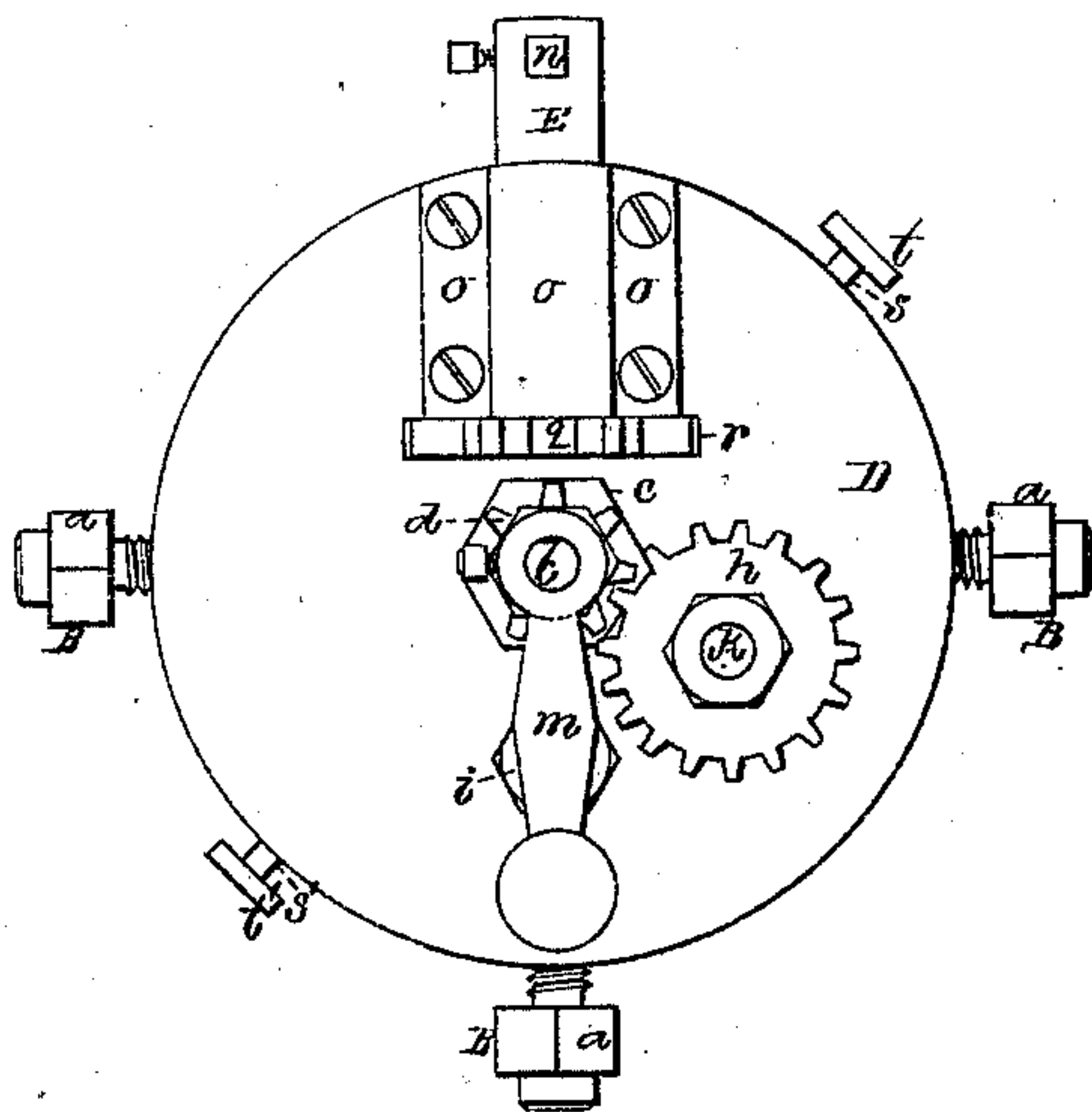


Fig. 2.

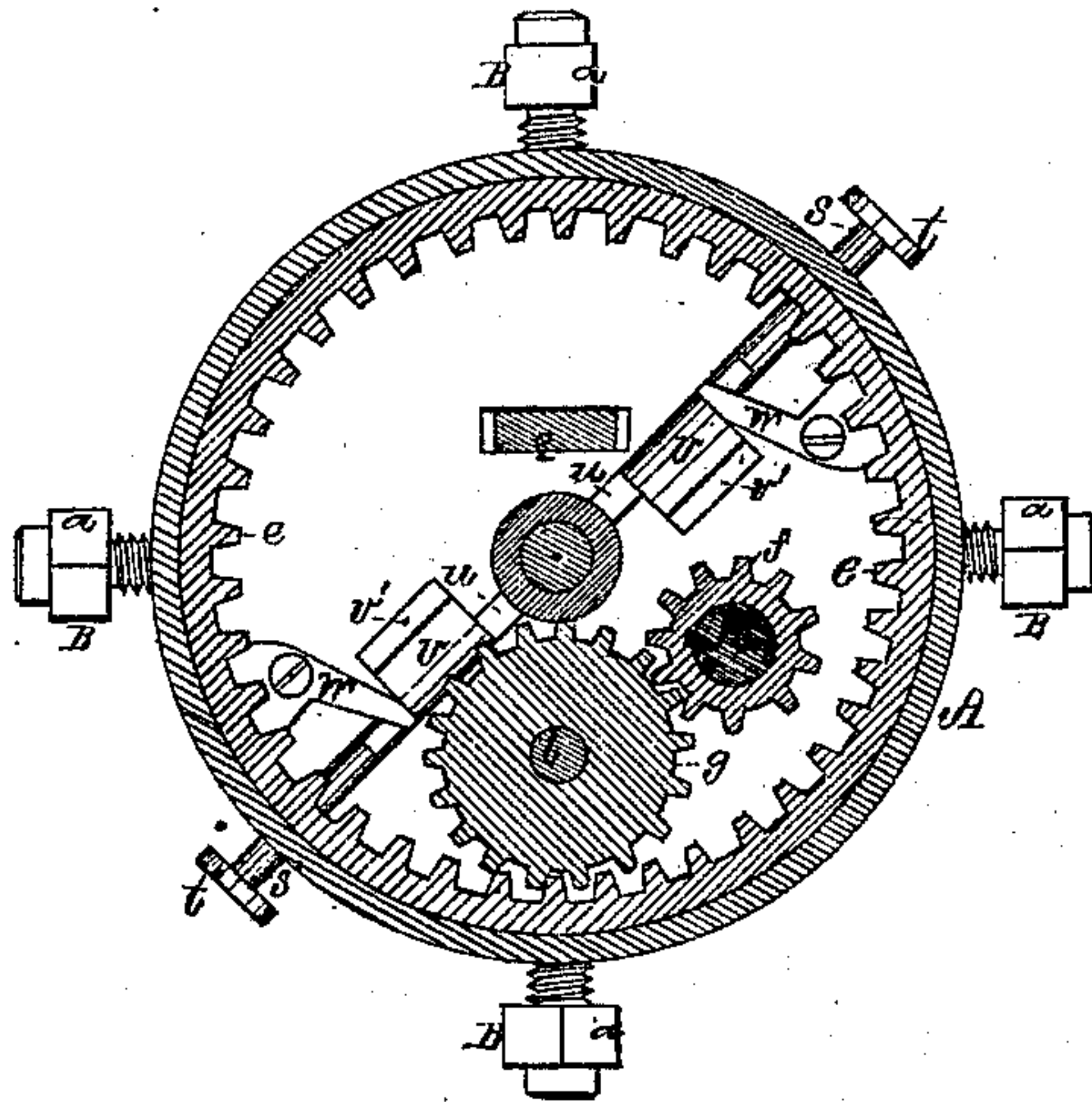


Fig. 4.

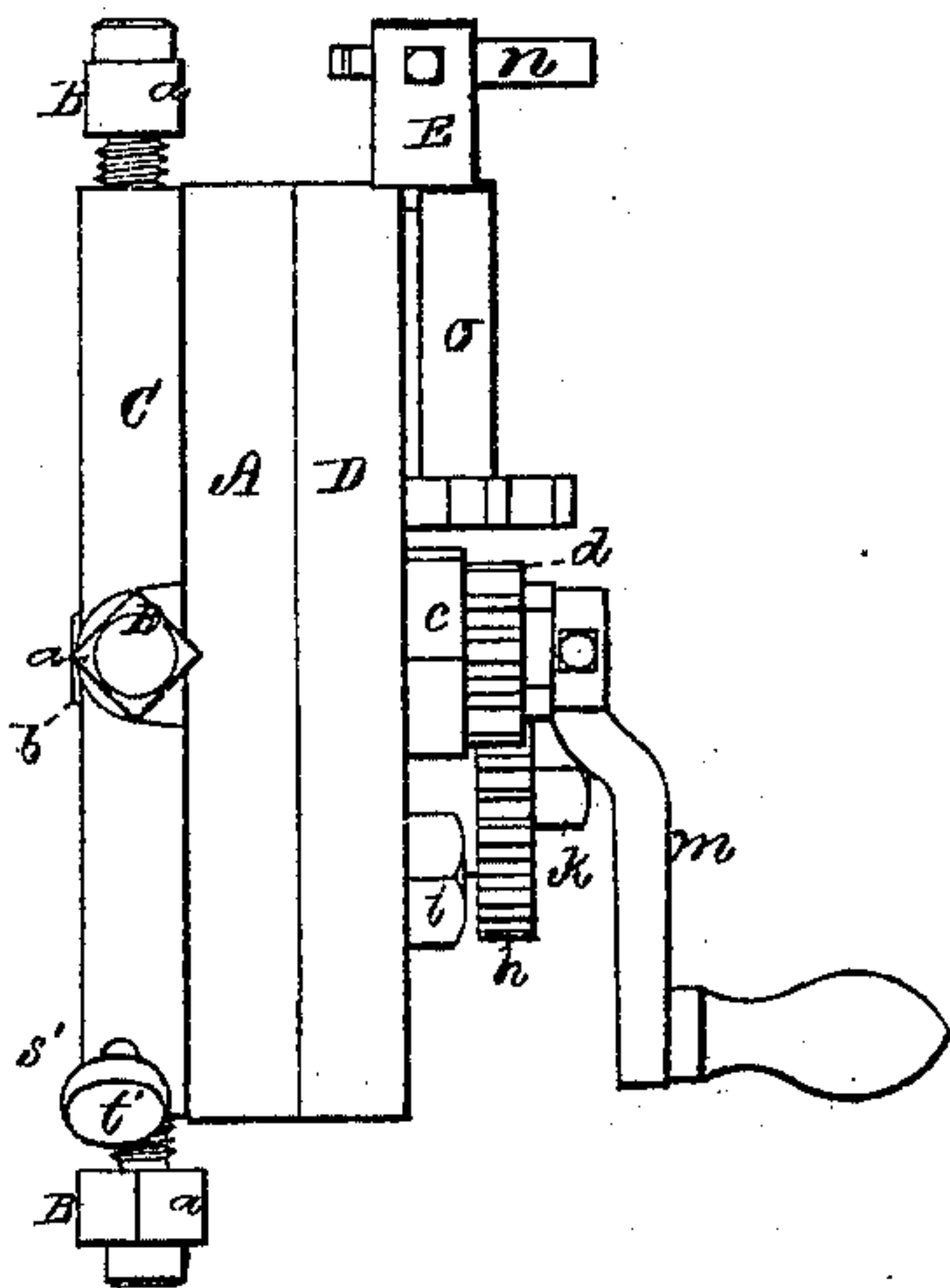
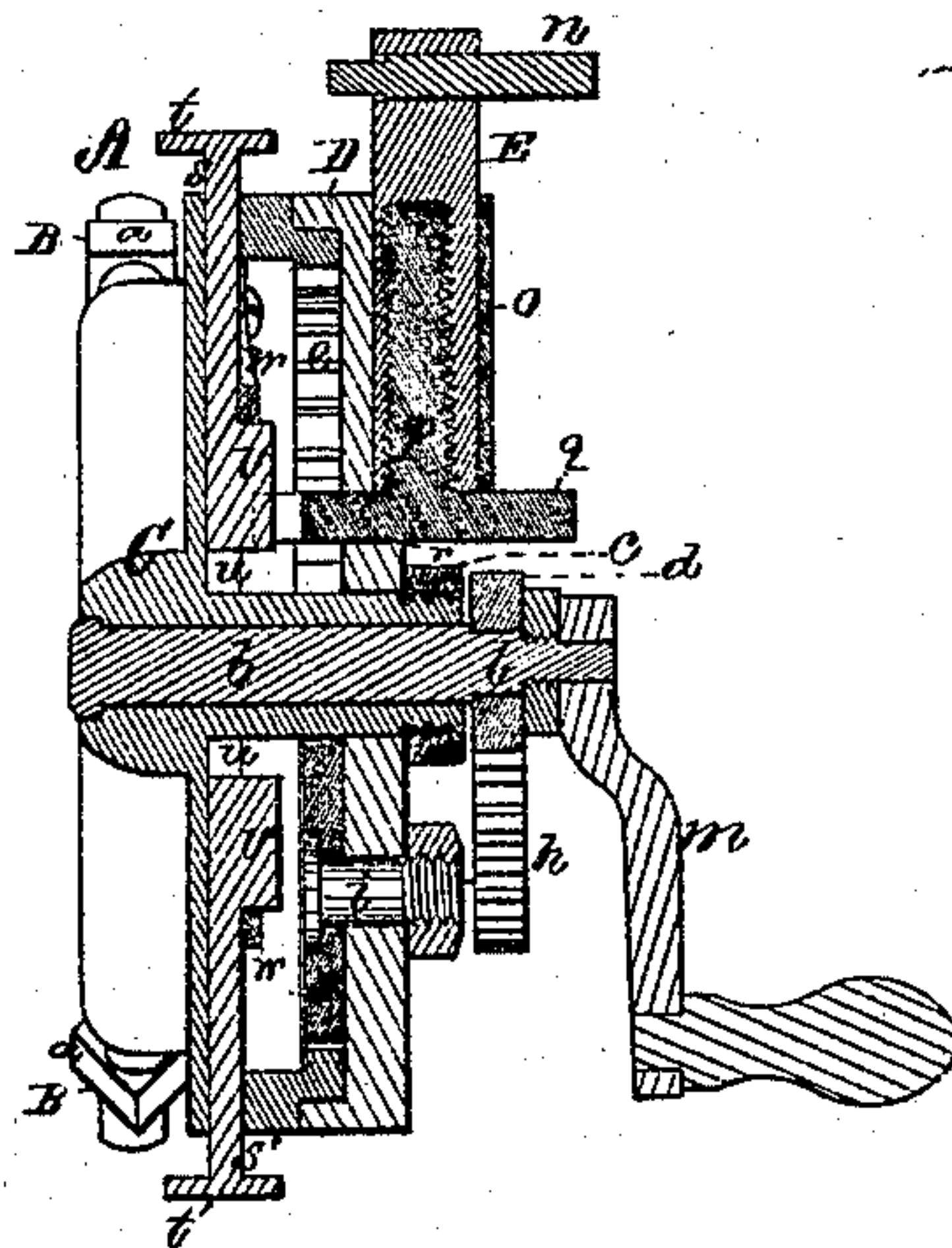


Fig. 3.



Witnesses.  
S. K. Piper  
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Nathan P. Stevens.  
by his attorney.  
R. H. May



# UNITED STATES PATENT OFFICE.

NATHAN P. STEVENS, OF HOPKINTON, NEW HAMPSHIRE.

IMPROVEMENT IN MACHINES FOR FACING THE ENDS OF TUBES AND HOLLOW CYLINDERS.

Specification forming part of Letters Patent No. 122,921, dated January 23, 1872.

*To all to persons whom these presents may come:*

Be it known that I, NATHAN P. STEVENS, of Hopkinton, of the county of Merrimack and State of New Hampshire, have invented a new and useful Machine for Facing the End of a Tube or Hollow Cylinder; and do hereby declare the same to be fully described in the following specification, and represented in the accompanying drawing, of which—

Figure 1 is a side view; Fig. 2, a horizontal section; and Fig. 3, a transverse section of it. Fig. 4 is an edge elevation of it.

The machine is designed for dressing or turning down or reducing a tube or the cylinder of a steam-engine at its end, the machine being very useful for repairing the end of a cylinder when worn by steam so as to be loose or leak in the joint between the end and the cylinder-head, such machine performing the operation with certainty and accuracy, and with very little expenditure of human labor and attention in comparison to what would be required were the repair to be effected by manual labor by the use of a file or a cold chisel.

The machine is composed of the following essential elements: First, the tool-wheel supporter and its holding and adjusting-screws; second, the tool-wheel; third, mechanism for revolving the tool-wheel; and fourth, the tool-carrier and its feeding mechanism, all such elements being substantially as hereinafter explained and represented, arranged and combined essentially in manner and to operate as set forth.

In the drawing the tool-wheel supporter is shown at A, as composed of a circular box open at top and furnished with a series of adjusting and holding-screws, B B B B, each being projected from the periphery of the box or one end of a cross, C, making part of such box, and being screwed radially into the box or cross. Each screw is furnished with a prismatic-head, *a*, to enable it to be revolved by a wrench. The tool-wheel shown at D answers as a cap or cover to the box, and is to be applied to the box so as to be capable of being revolved on it or a tubular spindle, *b*, projected from the box at its center. A nut, *c*, screwed on the spindle

serves to hold the tooth-wheel D and its supporter A in their due relations to each other. An internal gear, *e*, is formed in the inner periphery of the box A, and engages with a train of gears, *f g h*, arranged as shown, and supported by pivots or centers *i k*, projecting from the tool-wheel, and disposed in manner as represented. The gear *h* which is outside of the tool-wheel, engages with a pinion or small gear, *d*, fixed upon a central shaft, *l*, arranged concentrically with the spindle *b*, and provided with a crank, *m*. On laying hold of such crank and revolving it the tool-wheel will be caused to revolve on its supporter. The tool-carrier is shown at E as provided with a cutting-tool, *n*, arranged in it as represented. This tool-carrier is applied to the tool-wheel so as to be capable of sliding on it radially the tool-carrier being held to the wheel by a clasp, *o*, arranged as shown. A screw, *p*, screwed longitudinally into the tool-carrier has on its inner end a gear-wheel, *g*, which extends through a slot, *r*, made in the tool-wheel. There are arranged radially in the box A two shafts, *s s'*, which extend beyond its periphery, and are there provided with milled heads *t t'*. Their shafts are arranged in grooves *u u'* in the bottom of the box, each shaft being furnished with a tooth, *v*, extended from it in manner as shown, there being in the box spaces or chambers *v' v'* for reception of such teeth. Springs *w w*, arranged in the box A, bear upon the shafts *S S'*, and serve by friction on them to hold them from turning when their teeth are down or not thrown up for effecting feeding of the tool. On revolving such shaft by the hand of a person applied to the milled head of such shaft, the tooth of the shaft may be turned up at right angles with the bottom of the box so as to engage with the feed-wheel during each orbital revolution of it. The tooth will be locked in its upward position by pushing its shaft outward so as to cause the tooth to enter that part of the groove *u* extended beyond the tooth-chamber and toward the center of the box. From the above it will be seen that during each orbital revolution of the feed-wheel it may be turned a little by either or both the teeth *v* so

as to cause the feeding-screw to revolve and advance the tool-carrier.

In using the machine it is to be placed within the end of the bore of the tube or cylinder to be faced, and to be fastened in place by the screws of the tool-wheel supporter. This having been properly effected, the crank is to be laid hold of and turned. The tool-wheel will be revolved and the tool will be advanced and be caused to cut into and reduce the end of

the cylinder square or at right angles with the axis of the cylinder the feed being increased by throwing up both of the movable teeth *v v*.

I claim as my invention—

The machine, substantially as described, for the purpose and to operate as set forth.

NATHAN P. STEVENS.

Witnesses:

R. H. EDDY,

J. R. SNOW.