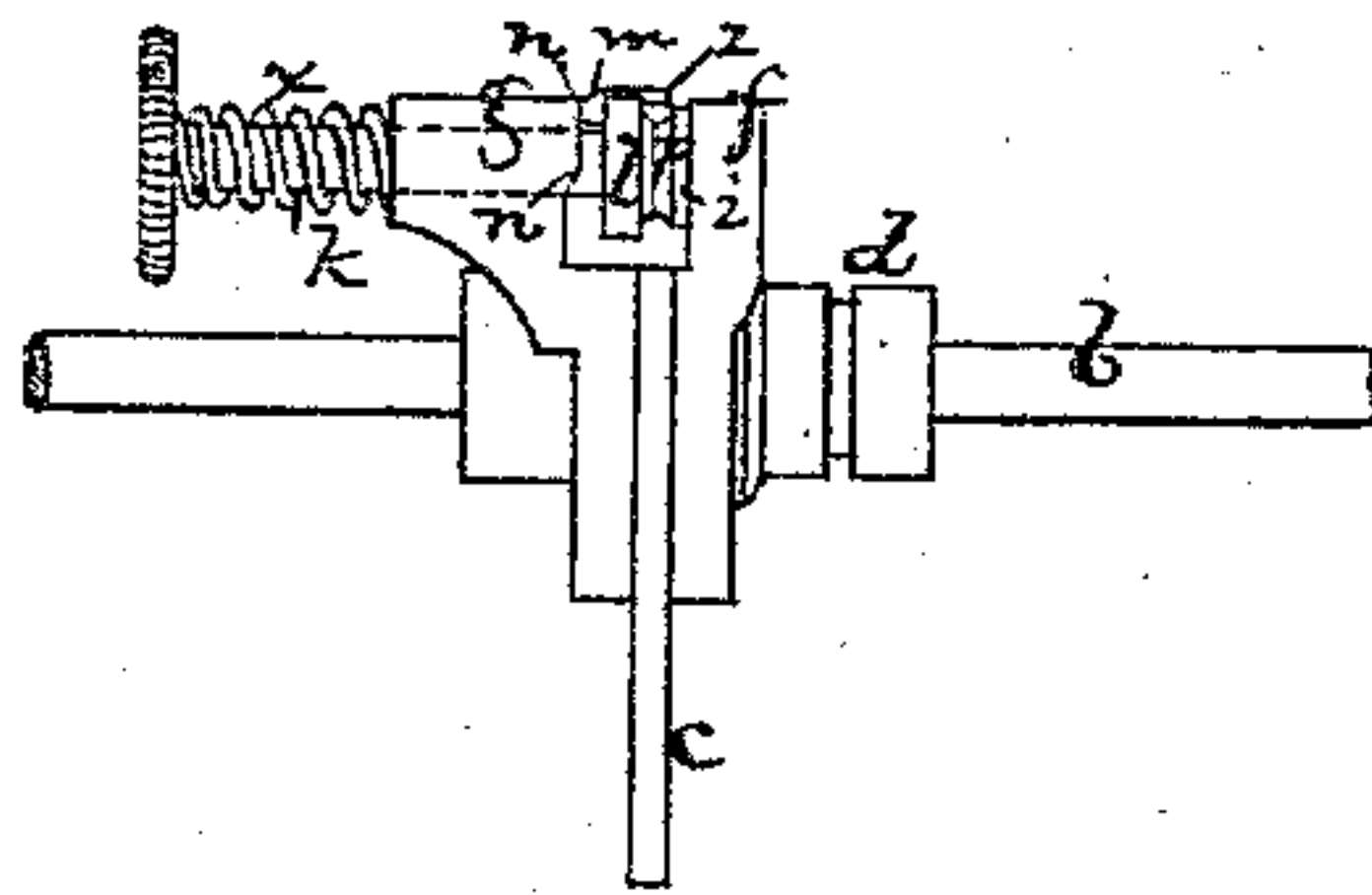
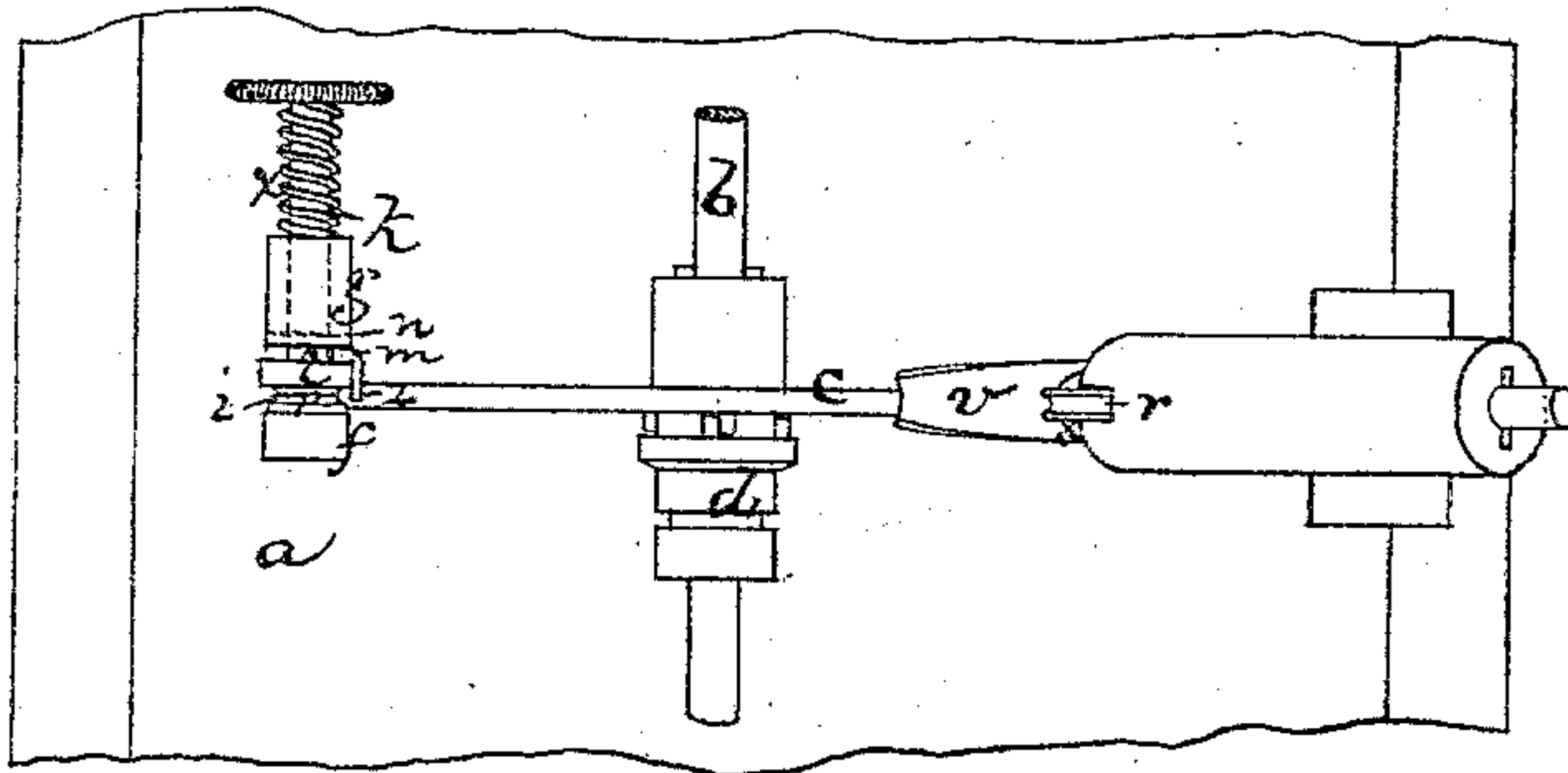
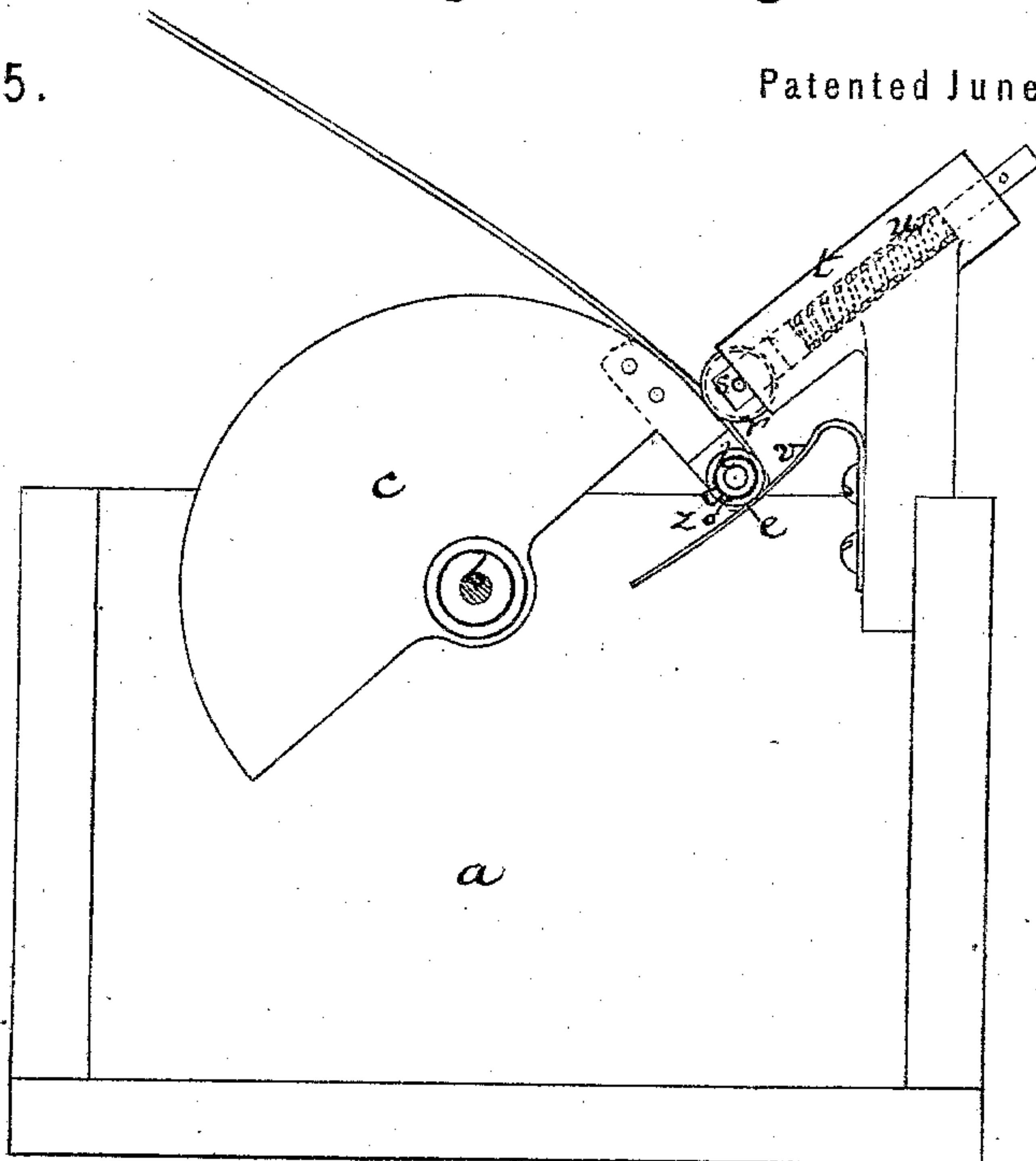


GEORGE F. SIMONDS.

Improvement in Machines for Bending and Hardening Horse-Rake Teeth.

No. 115,775.

Patented June 6, 1871.



G. F. Simonds  
by his Atty's  
Crosby & Gould.

Witnesses:  
C. H. Latimer.  
C. Warren Brown.



# UNITED STATES PATENT OFFICE.

GEORGE F. SIMONDS, OF FITCHBURG, MASSACHUSETTS.

IMPROVEMENT IN MACHINES FOR BENDING AND HARDENING HORSE-RAKE TEETH.

Specification forming part of Letters Patent No. 115,775, dated June 6, 1871.

*To all whom it may concern:*

Be it known that I, GEORGE F. SIMONDS, of Fitchburg, in the county of Worcester and State of Massachusetts, have invented an Improvement in Bending and Hardening Horse-Rake Teeth, &c.; and I do hereby declare that the following, taken in connection with the drawing which accompanies and forms part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

This invention relates to mechanism for bending and hardening steel teeth for horse or other rakes.

The drawing represents, in plan and in sectional elevation, a bending mechanism and hardening vat or trough embodying my invention.

*a* denotes the vat or trough, made in suitable form, to contain any suitable hardening liquid or composition. Running longitudinally through the upper part of the vat is a rotary shaft, *b*, and upon this shaft are placed, in any suitable number, bending-segments, *c*, the shaft bearing sliding-clutch sleeves *d*, by movement of which the benders may be engaged with or disengaged from the rotating shaft. Each tooth is formed with an eye, *e*, at one end, by which eye it is suspended in the machine, and, to form this eye and gripe the wire, the grasping end of each bender is constructed as follows: *f g* denote two arms having a space between them. The inner face of the arm *f* has a revolving disk or boss, *i*, and through the other arm a shaft, *k*, extends, this shaft having on its inner end a disk, *l*, from which extends a stud, *m*, which stud, as the shaft is turned, rides up an incline, *n*, thereby forcing the disk toward the boss *i*. Opposite to the stud *m* is a tooth, *z*, and the end of the wire being thrust under this tooth and against a pin, *o*, the end movement of the shaft *k* causes the wire to be gripped between the tooth and a circular shoulder, *p*, on the boss *i*.

As the shaft *k* is then turned the gripe holds the end fast and bends it around the shoulder *p*, thus forming the eye *e*. If the eye of the tooth has been previously formed, and only the bending and hardening of the tooth remain to be done, the eye is placed upon the revolving disk *i*, the shaft *k* turned sufficient-

ly to gripe the eye between the disk *l* and disk *i*, and the bender *c* is then revolved, as before stated.

Adjacent to the gripping mechanism is the end of a groove, *q*, leading to the periphery of the bender *c*, and as the shaft *k* is turned the wire is drawn into this groove between it and a grooved friction-roll, *r*, which roll turns on a pin extending through a shaft or slide, *s*, sliding in a guide-piece, *t*, the roll being pressed toward the bender by a suitable spring, *u*.

As the shaft *b* is rotated the wire is guided to the periphery of the former *c*, and has its form imparted to it by being thus bent and held to such periphery. After the bender segment passes the presser-wheel a spring, *v*, continues to hold it to the bending periphery, and when the bender has rotated to such extent as to pass its length upon the wire, it will have descended with the wire into the hardening liquid. The bender is then unclutched from the shaft and holds the wire in its bent form in the liquid, where it is allowed to remain until the hardening is effected. The bender is then again thrown into connection with the shaft *b*, and, as it continues to rotate, the outer end of the tooth is released from the hold of the spring *v* and the other end is released by turning the shaft *k*, causing the stud *m* to pass by a shoulder on the arm *g*, the shaft and gripping tooth *z* being then thrown back by the action of a spring, *x*.

The gripe may be so arranged as to be automatically thrown back from the wire, and the shaft *k* may have a helical groove, into which a pin may project to throw the disk *l* toward the boss; but the gripping mechanism shown is very simple and can be very easily operated by hand.

Instead of directly combining the bending mechanism and hardening vat, as shown, the teeth may be bent upon formers independent of the vat, and such formers be subsequently placed in the hardening liquid, or so as to immerse in such liquid the teeth bent upon and held to the formers; but I prefer the arrangement of the bending mechanism and vat, as shown.

Instead of the roll *r* a rigid grooved shoe may be used to guide the wire, but the roll is preferable.

I claim—



1. The rotary griping and bending mechanism jointly with the hardening vat, relatively arranged, substantially as described.

2. In combination with the rotary bender, the mechanism for griping the wire, substantially as set forth.

3. In combination with the rotating bender, the mechanism for griping and bending the eye of the rake-tooth, substantially as described.

4. In combination with the bender and griping mechanism, the spring roll *r*, substantially as described.

GEO. F. SIMONDS.

Witnesses:

A. D. TOURTELLOTT,  
A. A. SIMONDS.