

(No Model.)

3 Sheets—Sheet 1.

A. EPPLER, Jr.

WIRE BURRING MACHINE.

No. 334,362.

Patented Jan. 12, 1886.

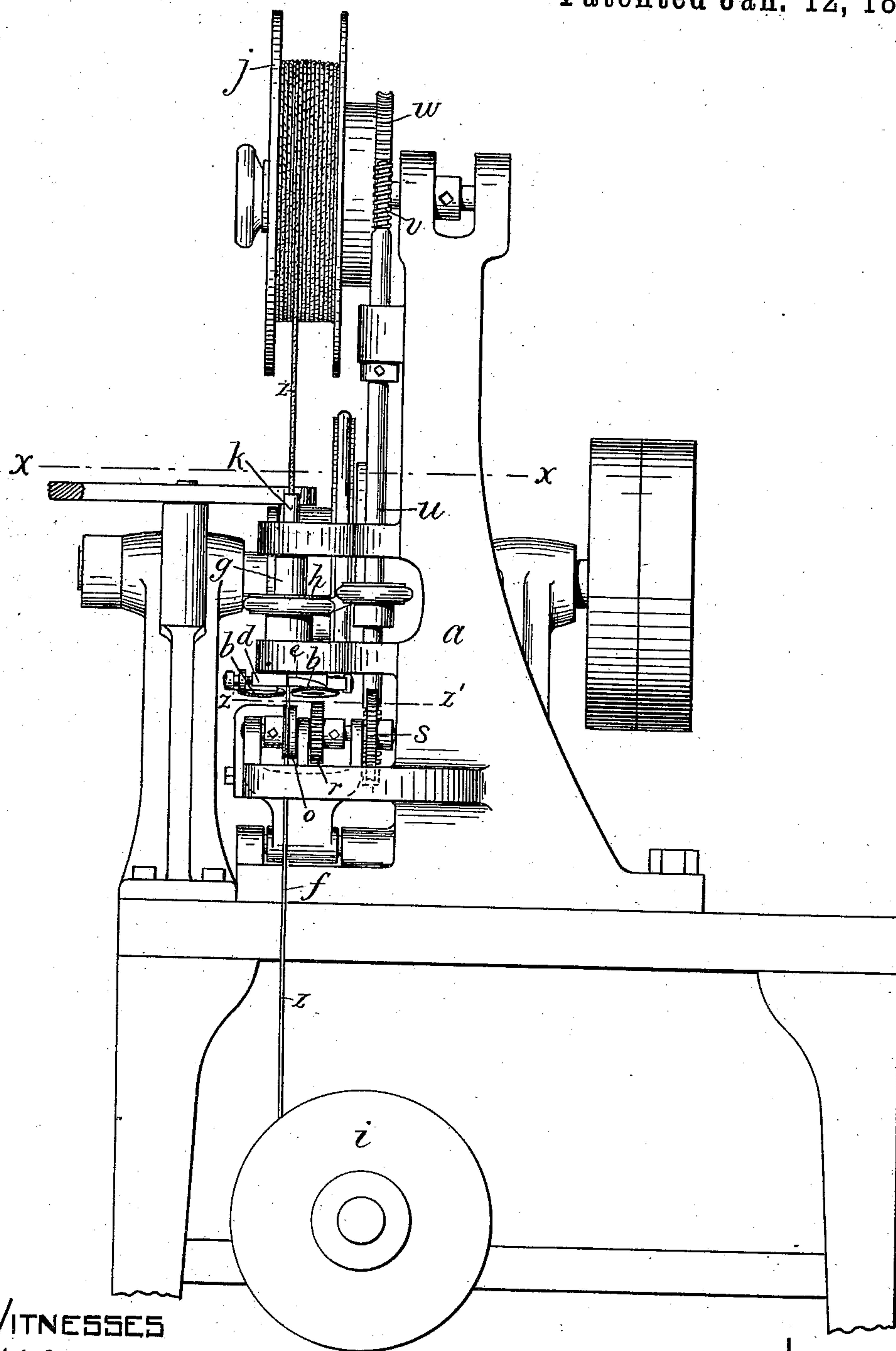


FIG. 1.

WITNESSES

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(No Model.)

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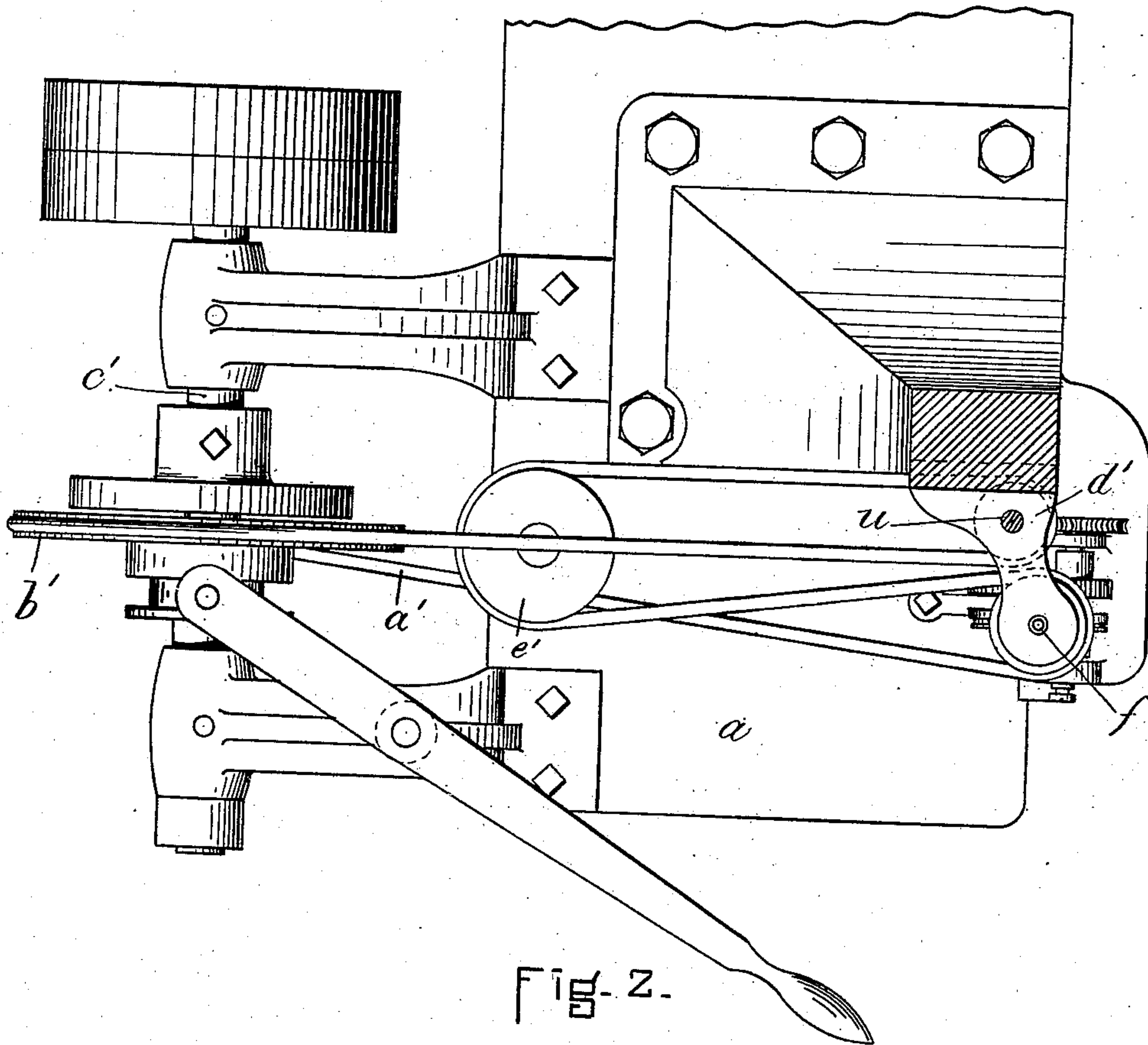


Fig. 2.

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(No Model.)

3 Sheets—Sheet 3.

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WIRE BURRING MACHINE.

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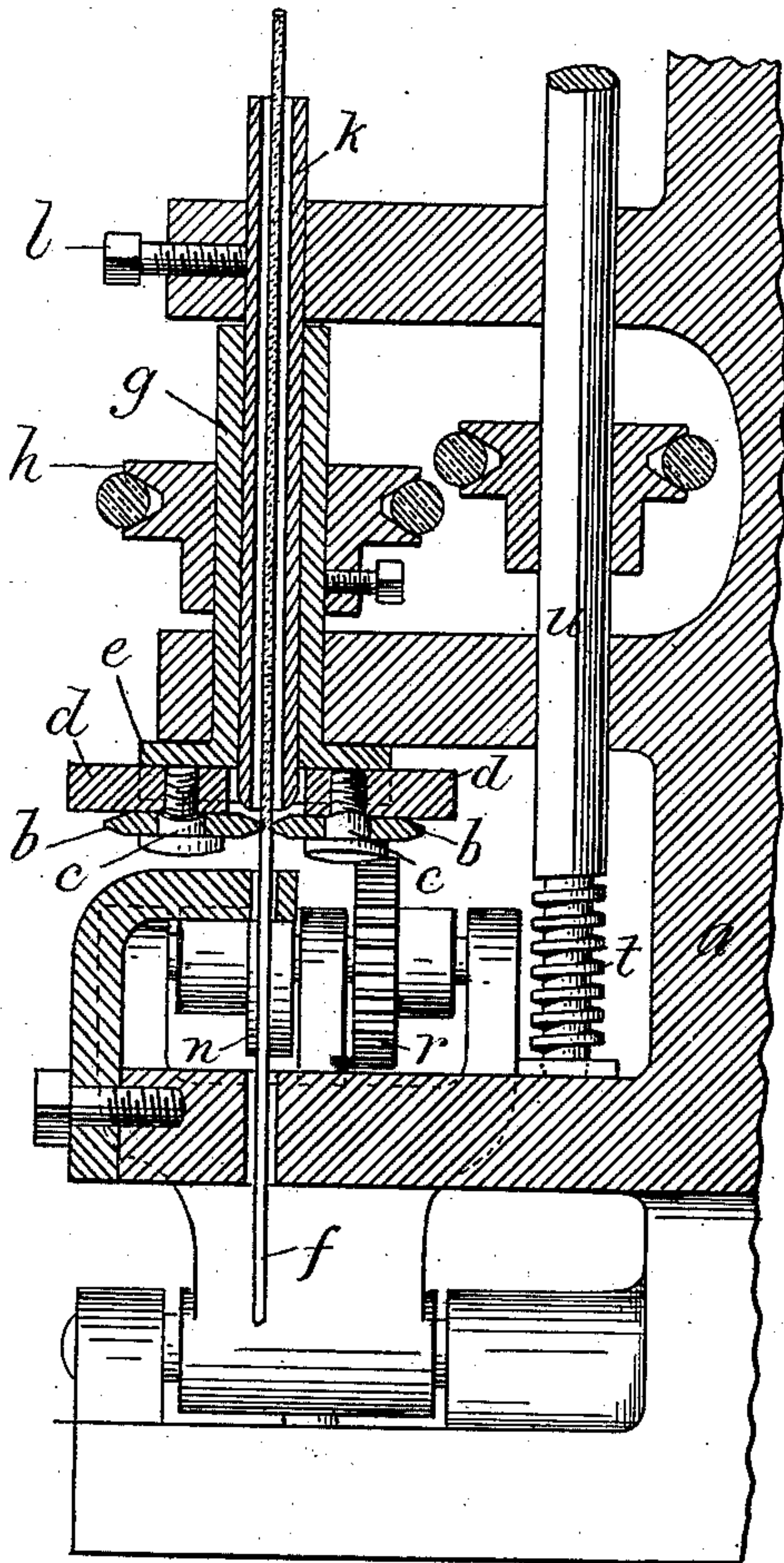


Fig. 3.

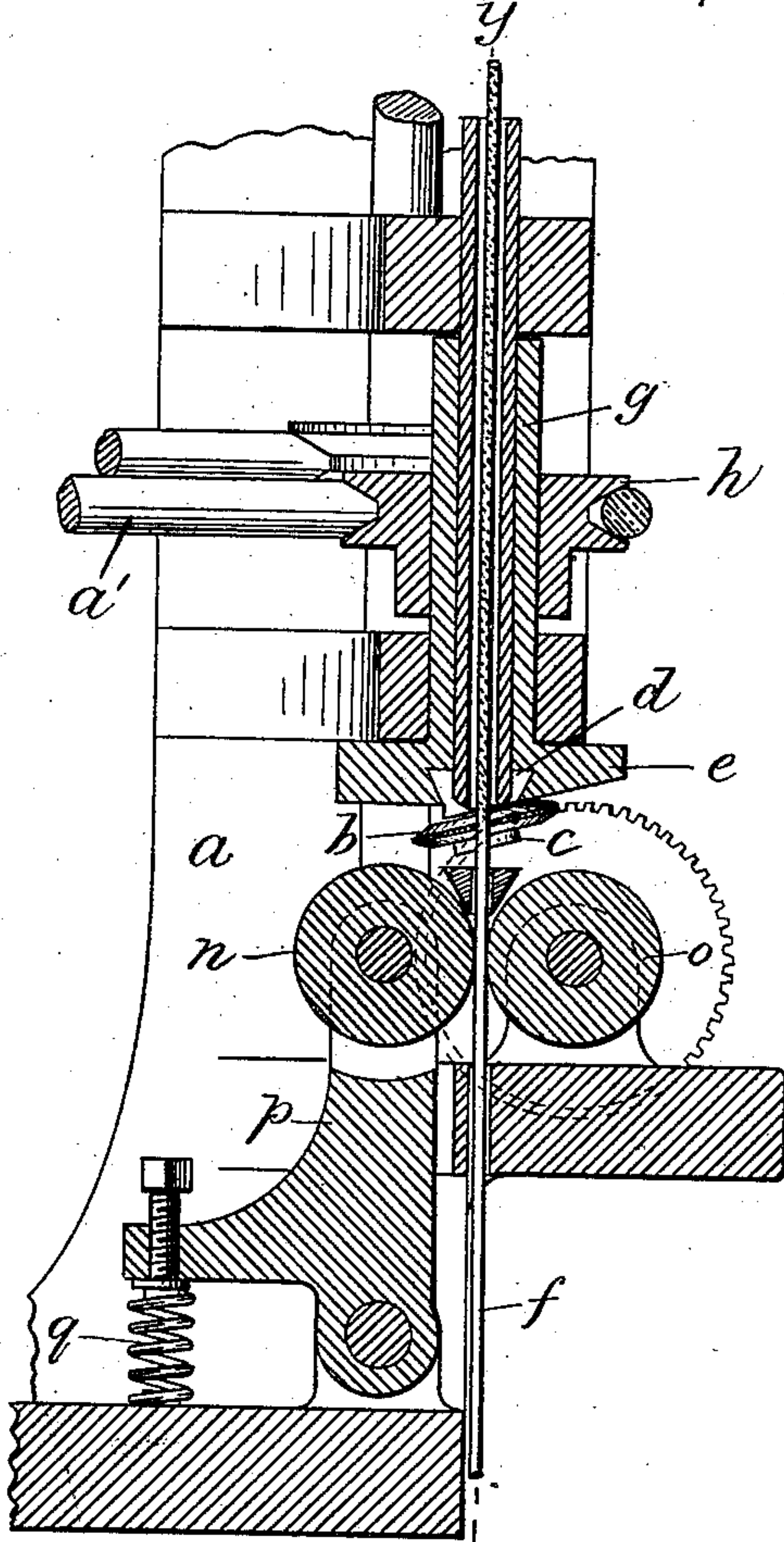


Fig. 4.

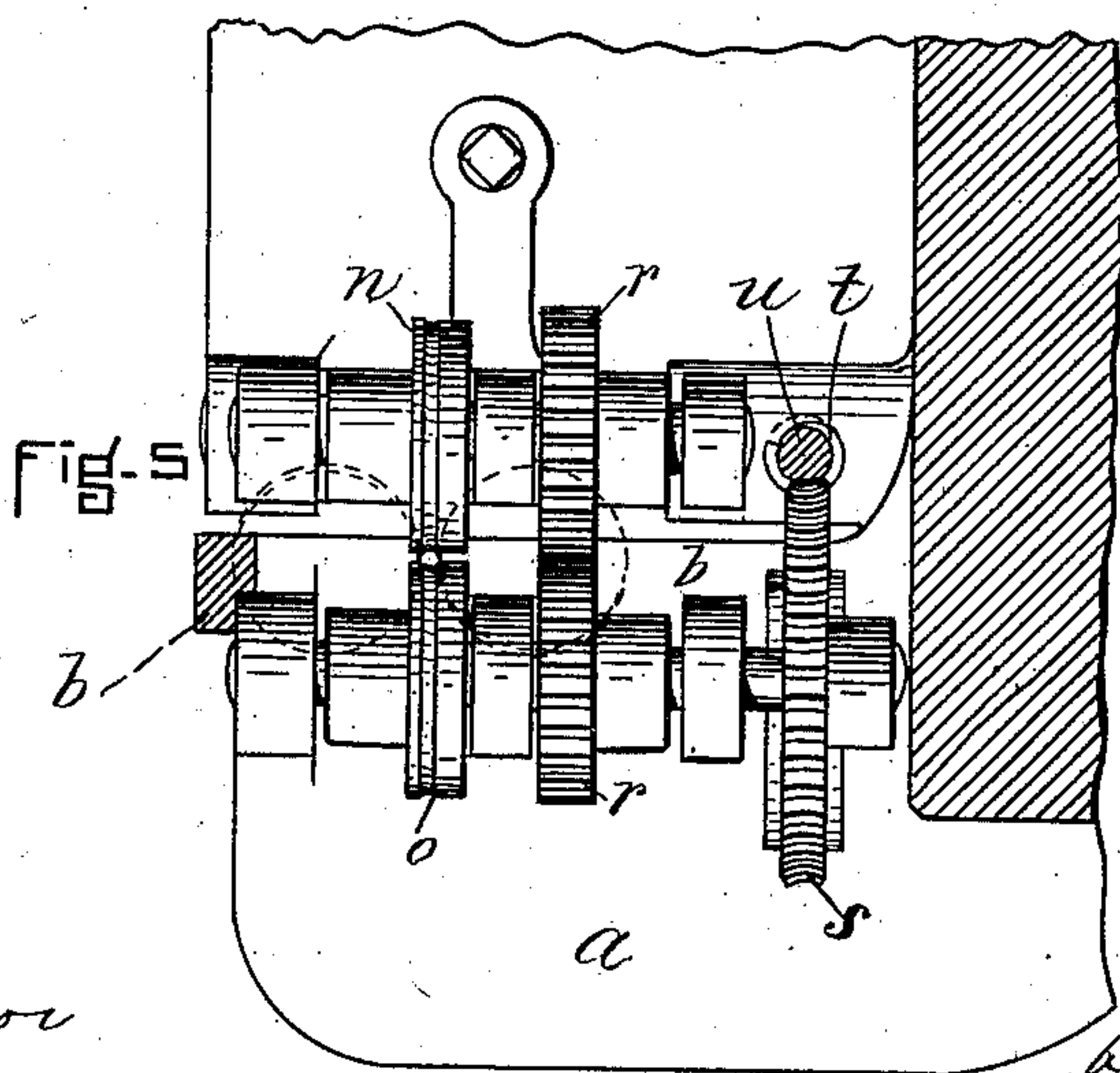


Fig. 5.

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# UNITED STATES PATENT OFFICE.

ANDREW EPPLER, JR., OF BOSTON, MASSACHUSETTS.

## WIRE-BURRING MACHINE.

SPECIFICATION forming part of Letters Patent No. 334,362, dated January 12, 1886.

Application filed September 9, 1885. Serial No. 176,553. (No model.)

*To all whom it may concern:*

Be it known that I, ANDREW EPPLER, JR., of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Wire Burring or Barbing Machines, of which the following is a specification.

This invention has for its object to provide a simple and durable machine for forming independent burrs or slight barbs on wire intended to be converted into boot and shoe nails.

To this end the invention consists in the combination of two burr-forming tools, a positively-rotated holder, on which said tools are set obliquely, and mechanism for feeding the wire between said tools, each tool being adapted to rotate loosely, and being set at a pitch opposite to that of the other, so that when the wire to be treated is passed between said tools and they are revolved about the wire by the rotation of the holder each tool will swage or indent the wire, and thus make a spiral series of burrs or barbs.

The invention also consists in certain details, all of which I will now proceed to describe.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a front elevation of a machine provided with my improvements. Fig. 2 represents a section on line *xx*, Fig. 1, looking downwardly. Fig. 3 represents a vertical section on line *yy*, Fig. 4. Fig. 4 represents a vertical section on line *zz*, Fig. 1. Fig. 5 represents a horizontal section on line *z'z'*, Fig. 1, looking downwardly.

The same letters of reference indicate the same parts in all the figures.

In the drawings, *a* represents the frame of the machine, supporting the parts hereinafter described.

*b b* represents the burring-tools, which are simply disks with serrated perimeters, each perimeter being formed to make a series of isolated indentations or burrs on the wire to be treated. Said disks are adapted to rotate loosely on studs *C C*, Fig. 3, which are affixed to slides *d d*, said slides being inserted in dovetail sockets in the positively-rotated holder *e*, and capable of being moved toward and from each other, to adapt the burring-tools to the size of the wire, *f*, to be treated, the tools bearing against opposite sides of the wire, as shown

in Figs. 1 and 3. The holder *e* is provided with a tubular stud, *g*, which is journaled in suitable bearings in the frame *a*, and has a pulley, *h*, on which runs the driving-belt whereby the holder is rotated. The wire, *f*, to be treated passes from a suitable supporting-reel, *i*, at the lower portion of the frame *a*, between the burring-tools *b b*, and through the tubular stud of the holder *e* to a positively-rotated reel, *j*, at the upper portion of the frame. A tubular guide, *k*, affixed to the frame *a* by a set-screw, *l*, projects through the tubular stud *g*, to prevent the wire from coming in contact with said stud. The burring-tools are set obliquely, and each is set at an inclination opposite to that of the other, as indicated in Fig. 1. This arrangement of the tools, together with their freedom to rotate loosely, their contact with the wire, their revolution about the wire by the rotation of the holder, and the progressive endwise movement of the wire, causes the tools to swage or indent the wire, and thus form independent burrs or barbs in spiral rows or series on the wire, each tool being rotated on its own axis by its contact with the wire. The result is the formation of the burrs or barbs on the wire with the minimum of wear and strain on the knurling-tools, the tools being capable of long-continued use without renewal or repairs. The burrs or barbs thus formed are independent or isolated from each other, and are not continuous grooves, their purpose being to simply roughen the surface of the wire, so as to increase the holding effect of the nails into which it is afterward converted without making spiral grooves in said wire.

*n o* represent feed-rollers, which grasp the wire below the burring-tools and feed it upwardly. One of said rollers is mounted in a rocking support, *p*, and is pressed toward the other roll by a spring, *q*. (See Fig. 4.) The arbors of said rolls are connected by gears *r r*, and the arbor of the roll *o* has a worm-wheel, *s*, which meshes with and is rotated by a worm-wheel, *t*, on a vertical shaft, *u*. Said shaft has a worm, *v*, at its upper end, which engages a worm-wheel, *w*, on the reel *j*, and rotates the latter. The shaft *u*, with the feeding devices impelled thereby, and the holder *e*, are rotated by a single belt, *a'*, which passes from a pulley, *b'*, on the driving-shaft *c'*,



around a pulley,  $d'$ , on the shaft  $u$ , and from thence around an idle-pulley,  $e'$ , on the frame  $a$ , and from said idle-pulley around the pulley  $h$  on the stud of the holder  $e$ , and then back to the driving-pulley  $b'$ .

The advantage of thus driving both the burring-tools and the feeding devices by a single belt is, that said tools and feeding devices necessarily stop together, so that the knurling-tools cannot be injured by the movement of the wire across them when they are not revolving.

I am aware that loosely-rotatable dies or tools set obliquely in a revolving holder and formed to form continuous spiral grooves in a wire have been before used, and I therefore wish to be understood as claiming only the disks as formed to make isolated indentations and combined with the other parts, as set forth in the following claims.

I claim—

1. The combination, with wire-feeding devices, of two loosely-rotatable burring-tools set obliquely at opposite sides of the wire, each tool being formed to make a series of independent or isolated burrs on the wire passed

between them, and a positively-rotated holder, whereby said tools are revolved about the wire, as set forth.

2. The combination of the positively-rotated holder having the tubular stud, the fixed tube or guide  $k$ , projecting into said stud, the loosely-rotatable burring-tools set obliquely on said holder, each tool being formed to make a series of independent burrs or barbs, and means, substantially as described, for feeding wire between said tools and through the tubular stud, as set forth.

3. The combination of the burring-tools and their rotary holder, wire-feeding devices, substantially as described, and a single driving-belt, whereby both the holder and feeding devices are operated, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 5th day of September, 1885.

ANDREW EPPLER, JR.

Witnesses:

C. F. BROWN,

H. BROWN.