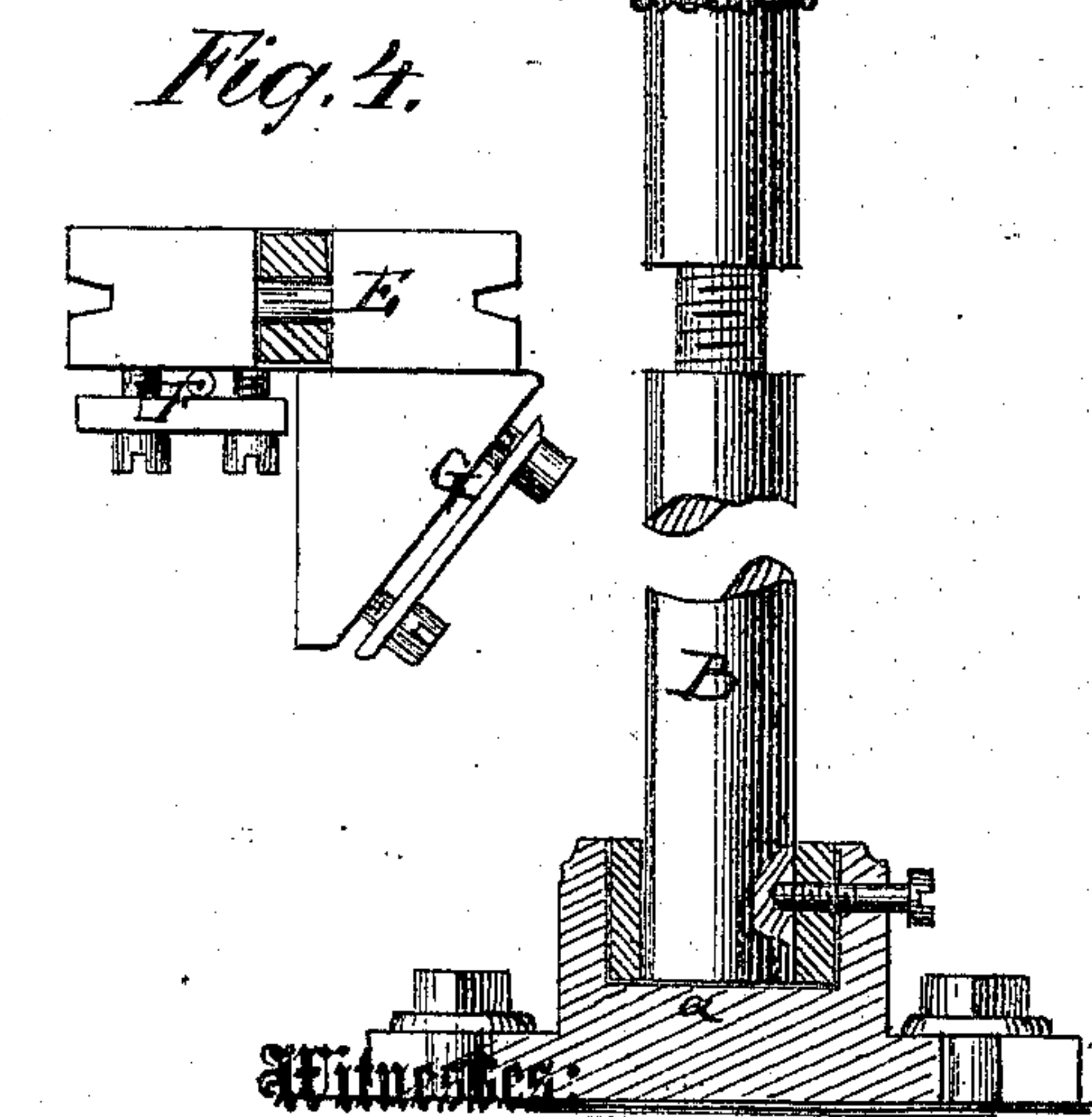
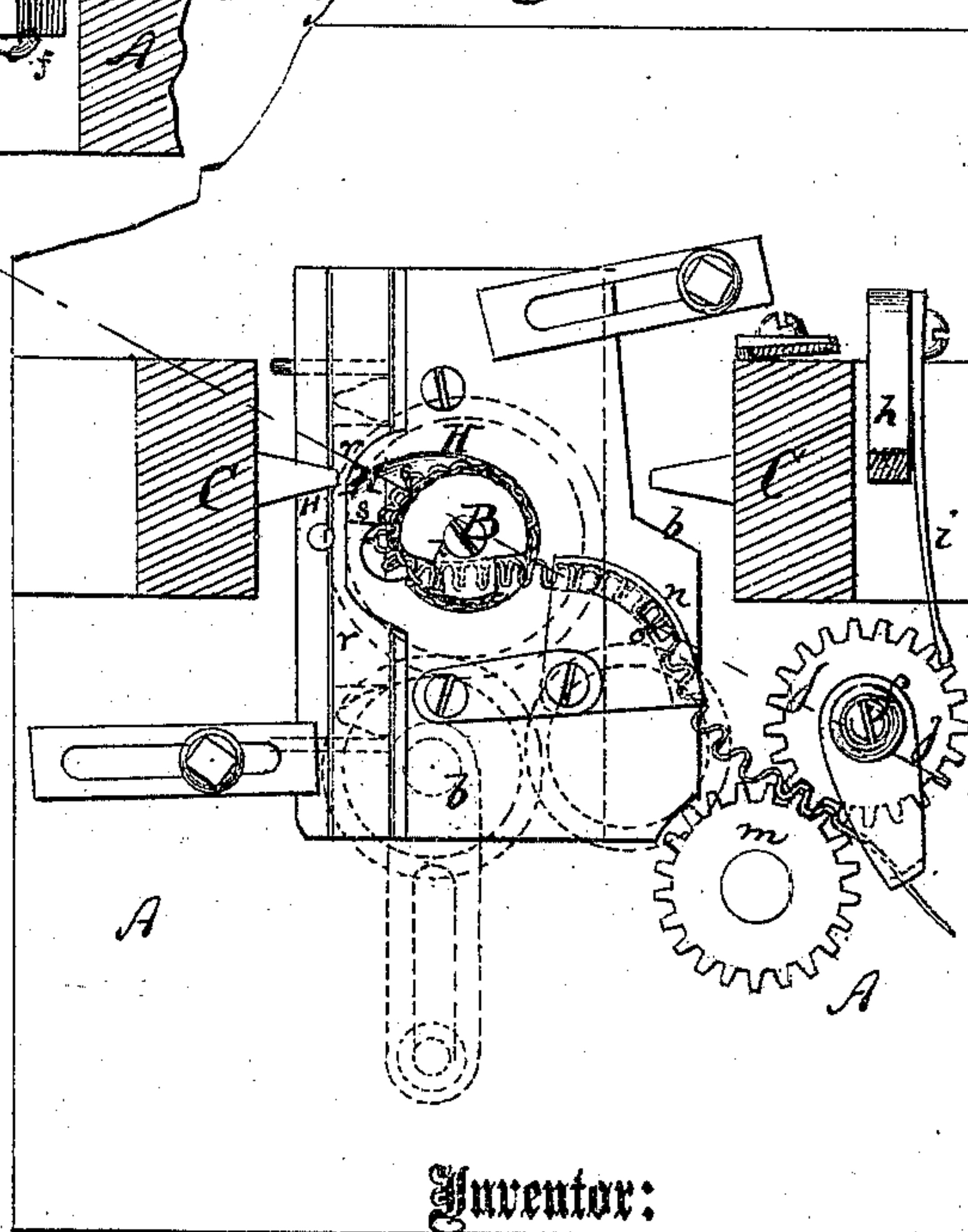
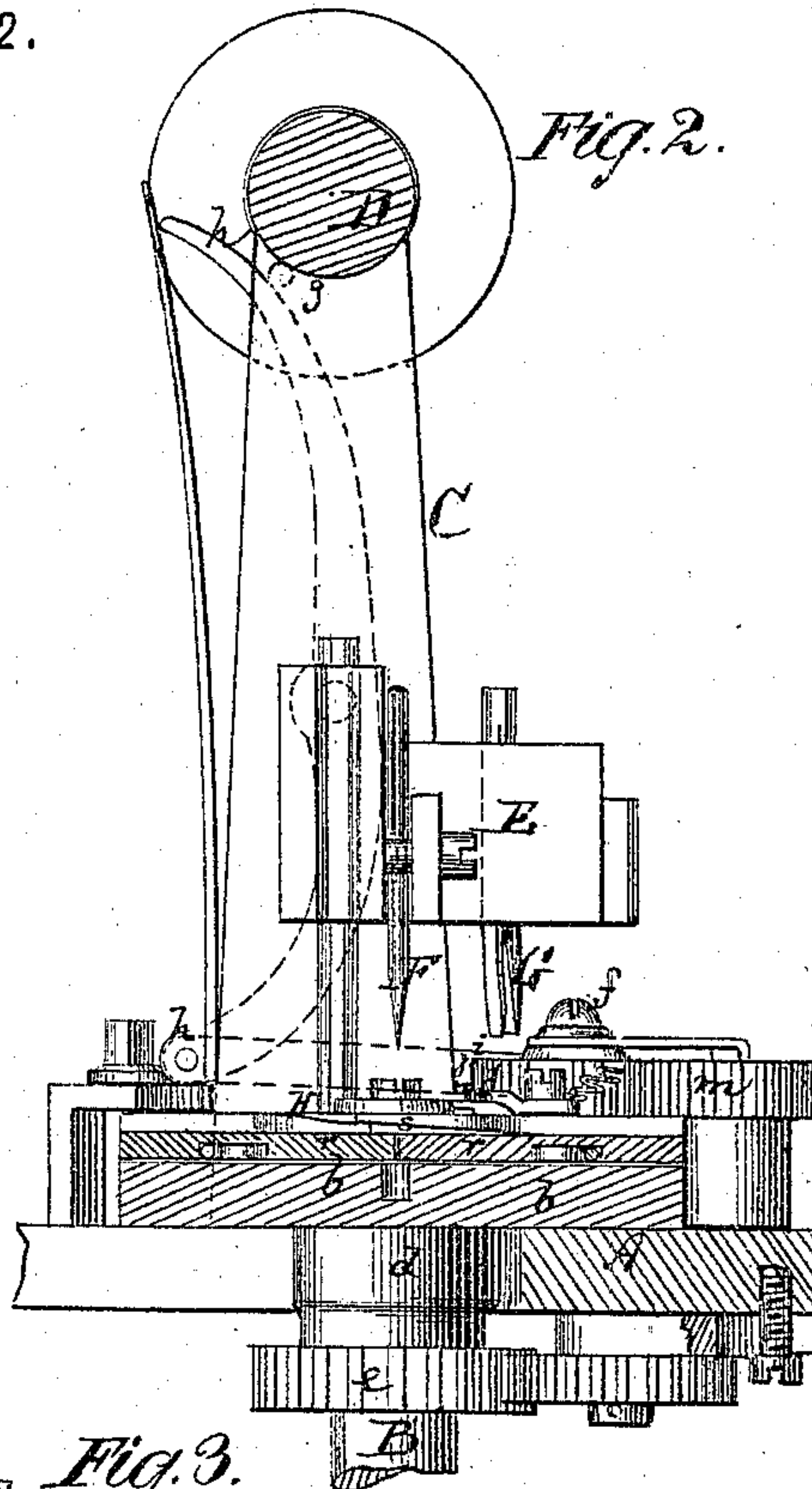
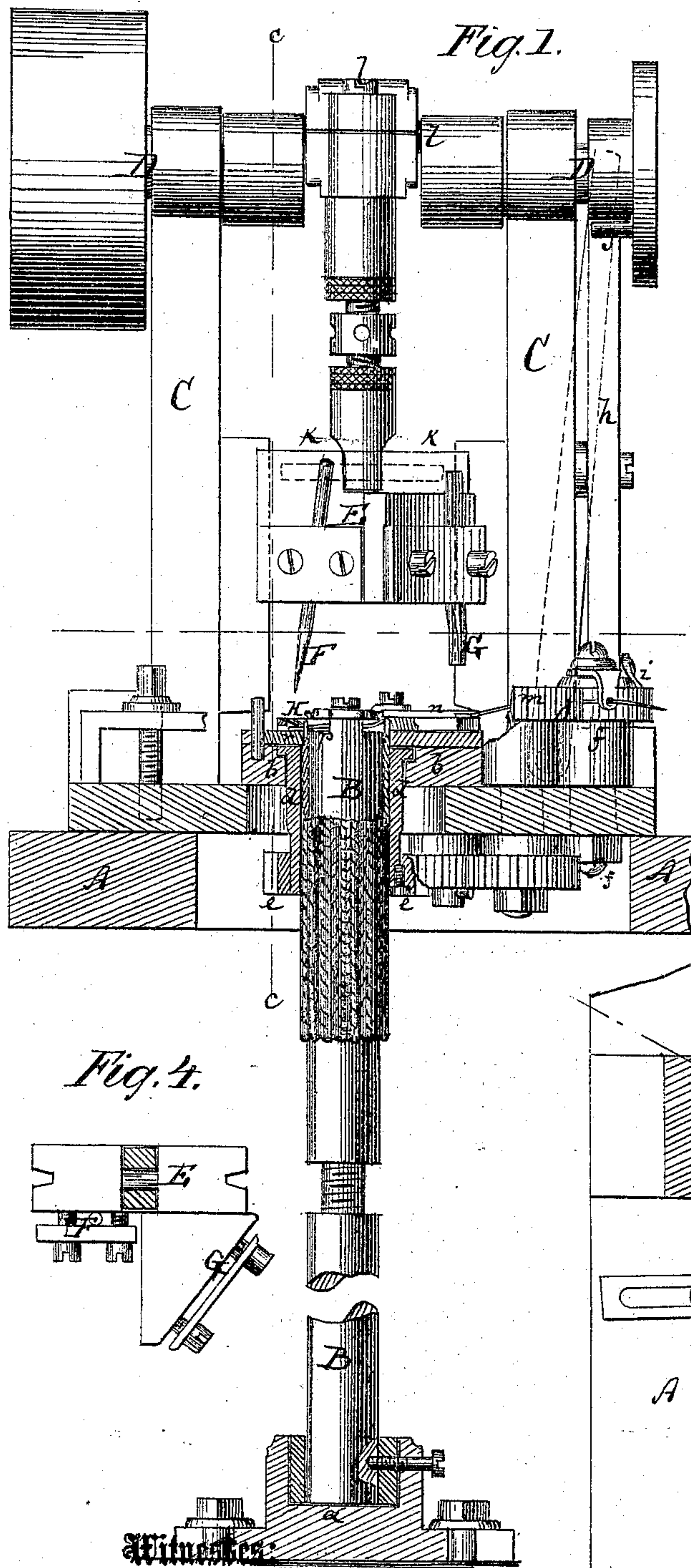


WILLIAM C. EDGE.
Improvement in Machines for Making Wire-Tubes.
No. 127,227. Patented May 28, 1872.



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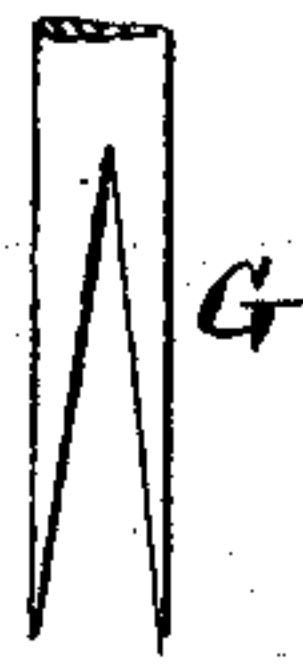


Fig. 5

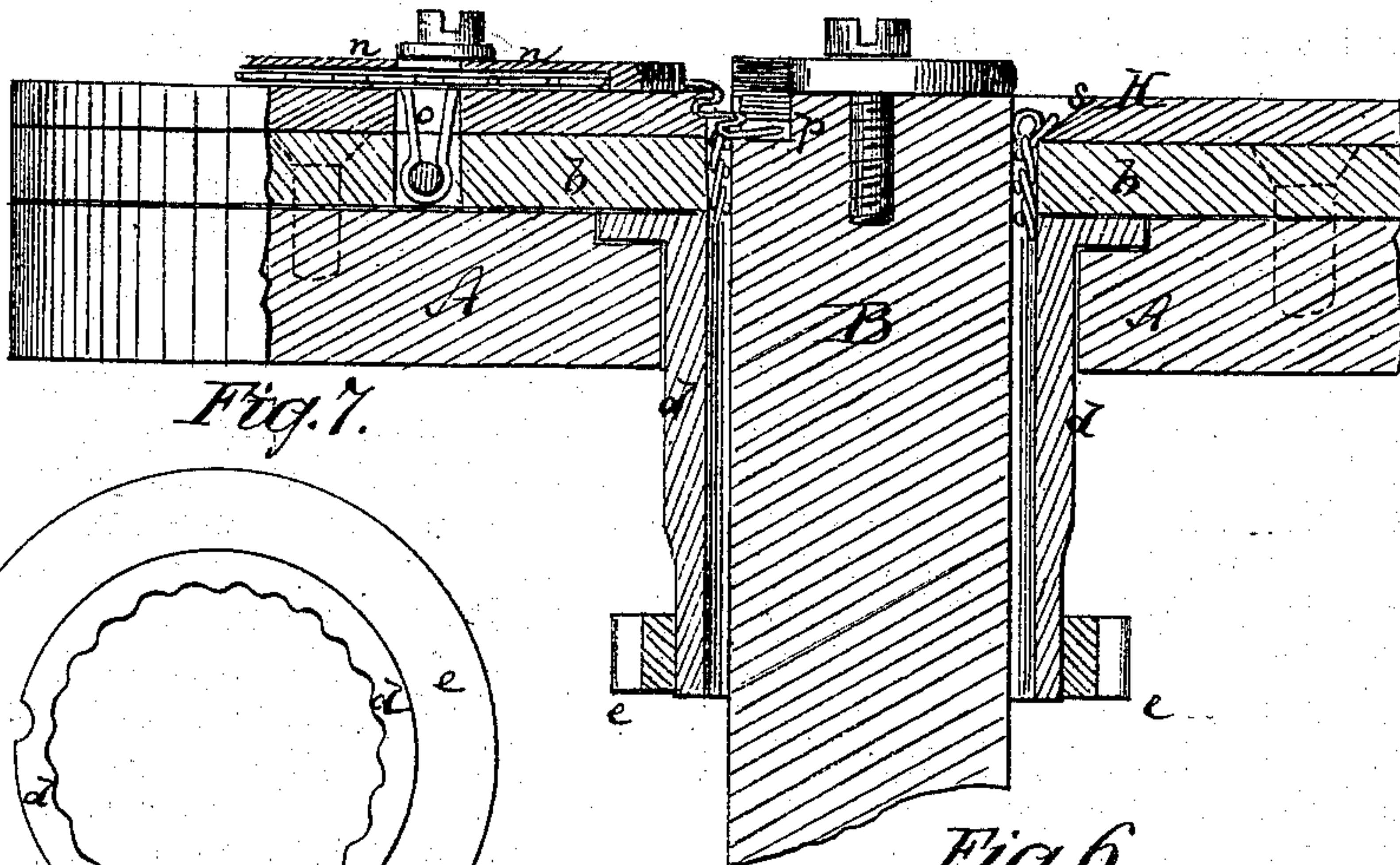


Fig. 6.

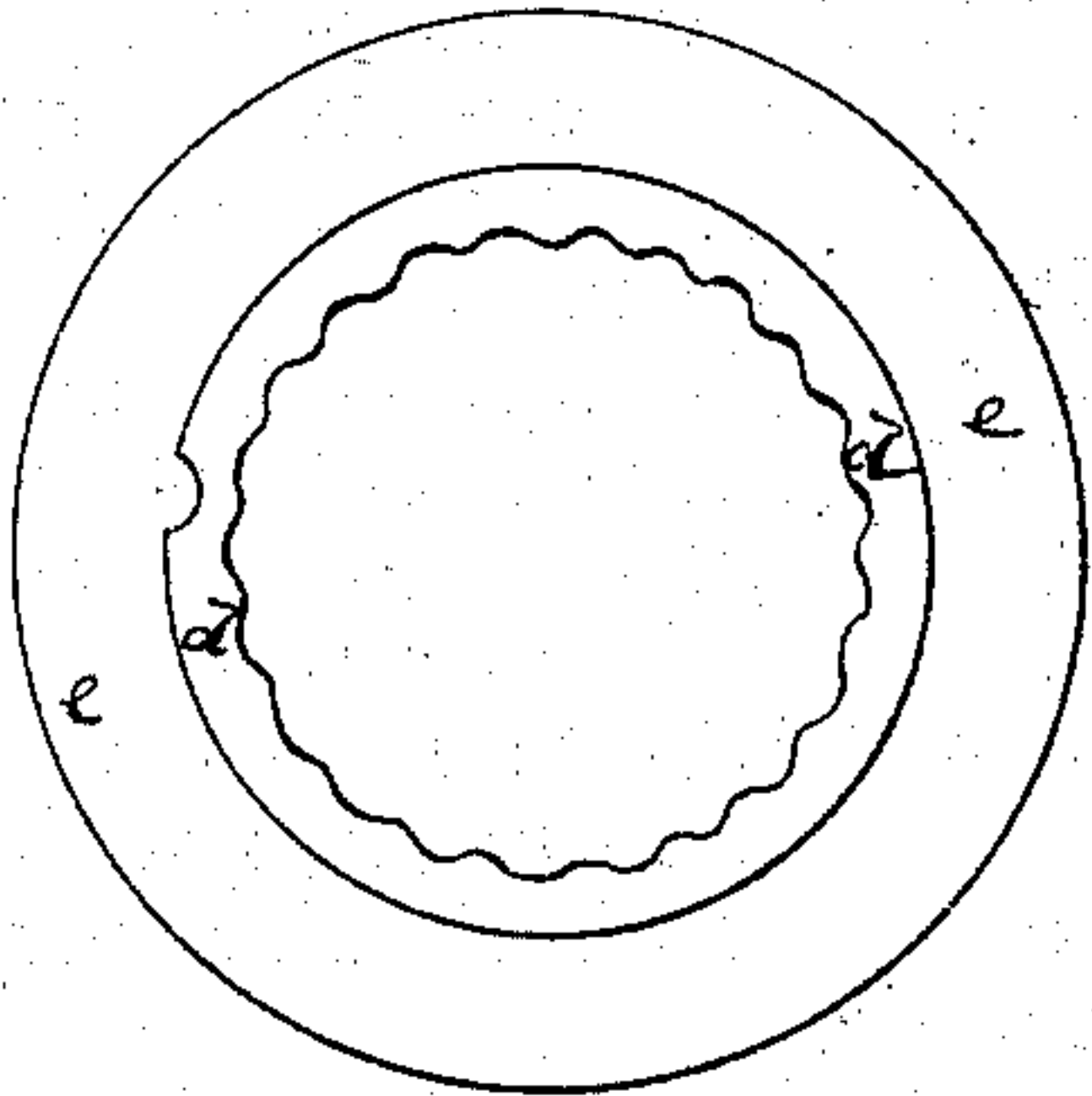


Fig. 7.

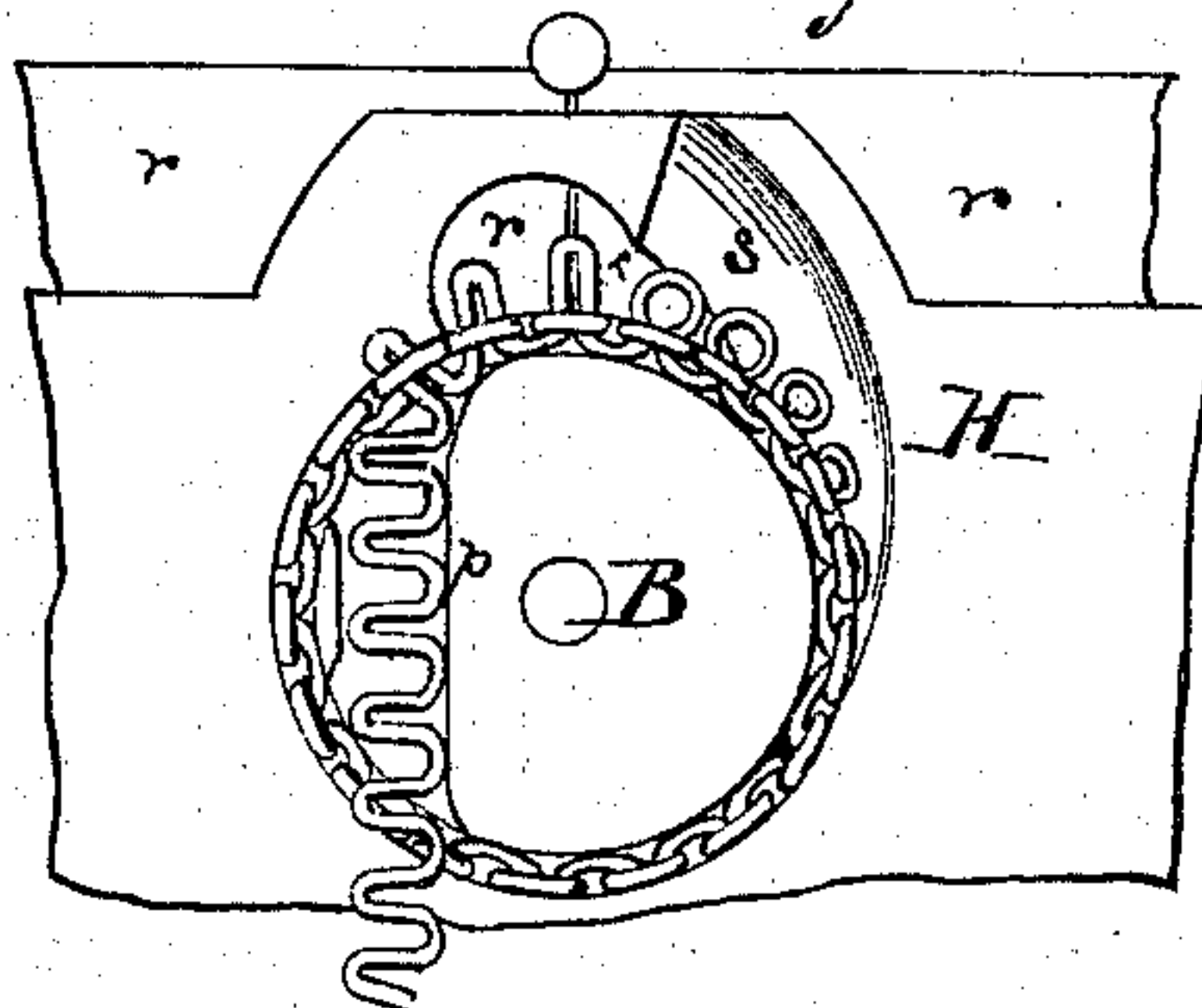
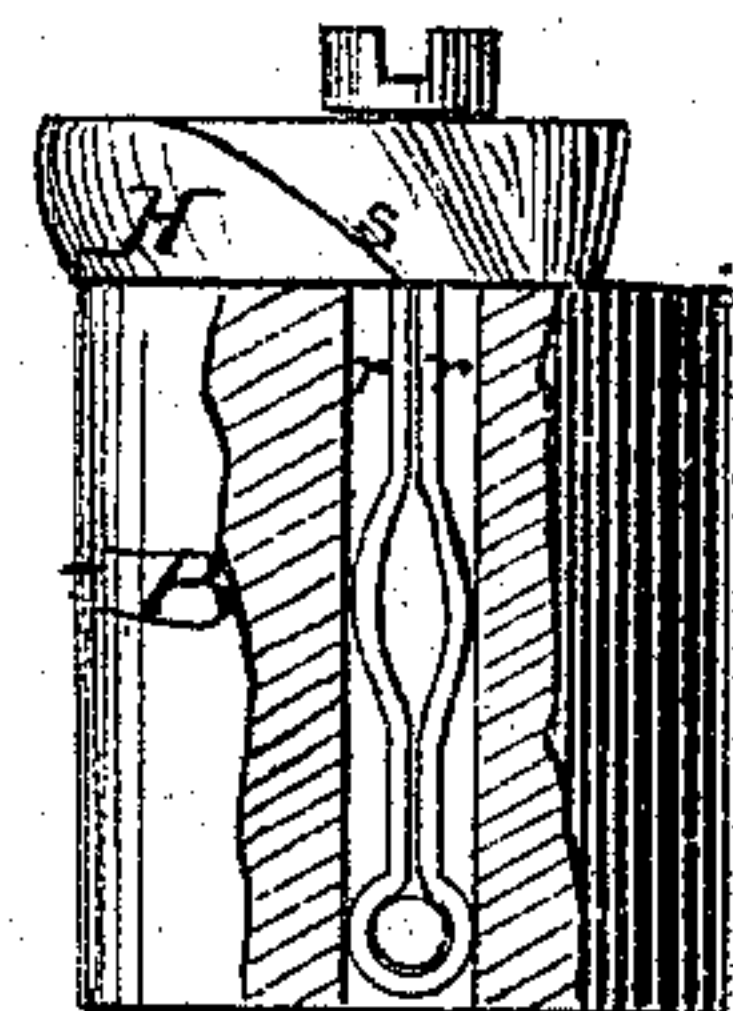


Fig. 8.

Fig. 9.



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UNITED STATES PATENT OFFICE.

WILLIAM C. EDGE, OF NEWARK, NEW JERSEY.

IMPROVEMENT IN MACHINES FOR MAKING WIRE TUBES.

Specification forming part of Letters Patent No. 127,227, dated May 28, 1872.

Specification describing a new and Improved Wire-Knitting Machine, invented by WILLIAM CHARLES EDGE, of Newark, in the county of Essex and State of New Jersey.

Figure 1 represents a front elevation, partly in section, of my improved machine for knitting and making metal tubes, &c. Fig. 2 is a vertical transverse section of the same on the line *c c*, Fig. 1. Fig. 3 is a sectional top view of its bed-plate. Fig. 4 is a detail horizontal section on the line *k k*, Fig. 1; Fig. 5, a detail vertical section on an enlarged scale, of the operating mechanism. Fig. 6 is a top view of the same. Fig. 7 is a detail face view of the sleeve that surrounds the receiving-rod. Fig. 8 is a top view of a modification of the mechanism; and Fig. 9, a side view partly in section thereof.

Similar letters of reference indicate corresponding parts.

This invention relates to a new machine for manufacturing from metal wire or metal links, continuous fabrics of tubular or other form on a small scale for jeweler purposes, or on larger scales for practical uses of various kinds. The principle of the invention consists in the arrangement of a reciprocating tool which expands the meshes that are put through completed loops of the fabric. By thus being expanded such meshes become absolute and well-connected parts of the entire fabric, and constitute loops for the reception of new meshes, to be expanded in turn. In this manner fabrics of various designs can be rapidly and accurately made by automatic process, and therefore cheaply produced. The invention consists, further, in various details of invention, such as the mechanism for shaping the wire on its way to the expander, the means of imparting the necessary motions to the several devices of the machine, the arrangement of spring-jaws for the reception of the expander and others, as hereinafter more fully described.

A in the drawing, Figs. 1 and 7, represents the bed-plate of the wire-knitting machine, supported on suitable frame-work, which is not shown in the drawing. Through this bed-plate projects from below a vertical rod, B, which rests with its lower end on a step or in a socket, *a*, while its upper end projects through the plate A and through a block, *b*,

which rests upon A. A swivel-sleeve, *d*, turning and hanging on the bed-plate or block *b*, embraces the rod B and carries a toothed wheel, *e*, which receives intermittent rotary motion by gearing connection from an upright arbor, *f*. In an upright frame, C, which projects from the bed A, are the bearings of a horizontal shaft, D, that receives rotary motion from suitable machinery. A spur, *g*, on this shaft, striking a lever, *h*, moves a pawl, *i*, against a toothed wheel, *j*, on the arbor *f*, and imparts thereby intermittent rotary motion to the wheel *j*, and also to the wheel *e* and sleeve *d*. The shaft D also carries a cam or crank, *l*, which serves to impart vertical reciprocating motion to a slide, E, from which the expanding pin or punch F and contractor G are suspended.

The wire to be knit into a tube is first passed between the contiguous edges of two gear-wheels, *j* and *m*, and thereby pressed into zig-zag form, as indicated in Fig. 3. It is then passed through a slotted attachment, *n*, of the block *b*, above which the contractor G is suspended. The contractor is forked at the lower part, as shown in Figs. 1, 2, and 5, and serves to compress or contract all the loops of the wire that project to one side of the wire, in order to make them narrow enough to fit the meshes of the fabric and insure the exact equidistance between the several loops. In the slotted attachment *n* is contained a V-shaped spring, *o*, which constitutes, at its upper ends, the real support of the loop to be contracted. The fork G in descending straddles the loop, and also the spring *o*, contracting the latter in equal ratio with the former, and causing it to continue as the support of the wire. The wire thus bent and released is next conducted along the fixed rod B, and in a crescent-shaped groove, *p*, thereof. The loop first projecting from said rod after having passed the groove *p*, is exactly under the expander F, which is an inverted conical pin, as shown. In descending the expander pierces such loop and enlarges it, entering below the wire between the formerly contiguous edges of two spring slides or jaws, *r r*, which constitute the support of the wire. The wire being further carried about the rod B, has its next loop brought under the expander and enlarged, and so forth. It is evident that the loops while un-

der the expander are in a horizontal position. By being carried further about the rod B they are turned up into a vertical position by being carried along the spiral inclined edges *s* of a stationary plate, H, that partly embraces the rod B, as indicated in Figs. 3 and 6. When a circle has thus been formed around the rod B, the next loop that comes under the expander will pass through the first vertical loop, and when subsequently expanded will be firmly united thereto, the same, with all subsequent loops, passing successively through the upright meshes. At the ends of the completed fabric they are expanded and turned up on the cam H.

The fabric thus knit embraces the rod B, and is held in tension by a weight, or otherwise, or drawn down by hand; and when it enters between the sleeve *d* and rod B will be automatically turned by the stated motion of the sleeve to carry the expanded loops ahead and feed the wire to the fabric.

It will be noticed that in the process just described the wire loops are from within pushed outwardly through the meshes of the fabric. Figs. 8 and 9 illustrate a modification whereby the loops will from without be pushed inwardly through the loop. In this case the spring-jaws *rr* must be formed on the upper end of the rod B, and also the cap H for turning up the loop, while the sleeve *d* may directly embrace the top of the rod B. The principle of operation, however, is the same.

The spring-jaws being held together whenever the expander is up, form a reliable support for the loop to be acted upon, but may in some cases, and for peculiar kinds of web, be dispensed with.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The rod B, arranged as a guide for the fabric which is being knit from the wire, as set forth.
2. The intermittent rotary sleeve *d* combined with the rod B, for turning the fabric, as set forth.
3. The wheels *j m*, arranged on the bed A of the machine for bending the wire into zig-zag form, as set forth.
4. The forked contractor G, applied to the wire-knitting machine, substantially as specified.
5. The V-shaped spring *o*, arranged in combination with the forked reciprocating contractor G, as set forth.
6. The rod B provided with the groove *p*, in which the wire is guided, as specified.
7. The reciprocating expander applied to a wire-knitting machine, substantially as and for the purpose herein shown and described.

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