

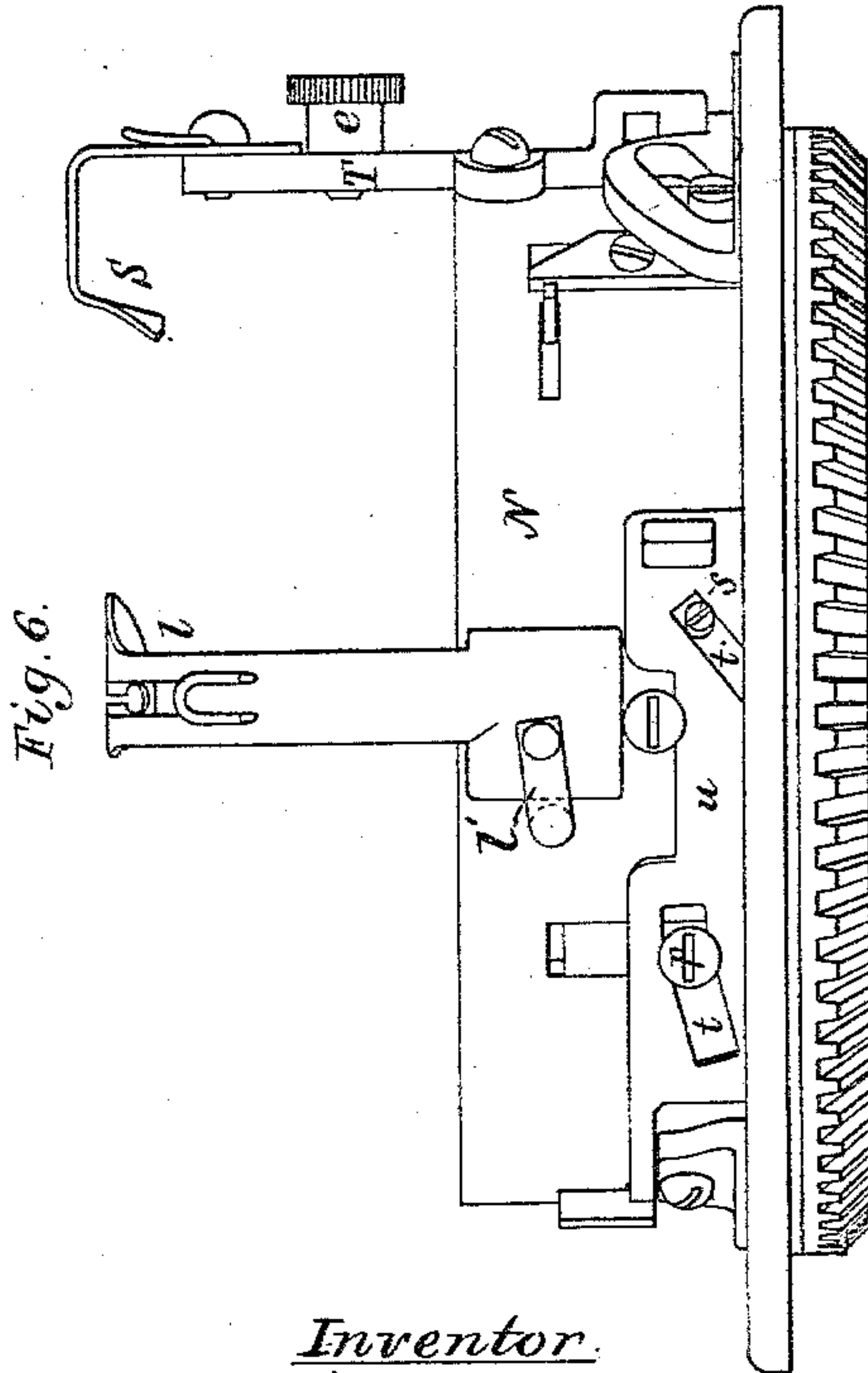
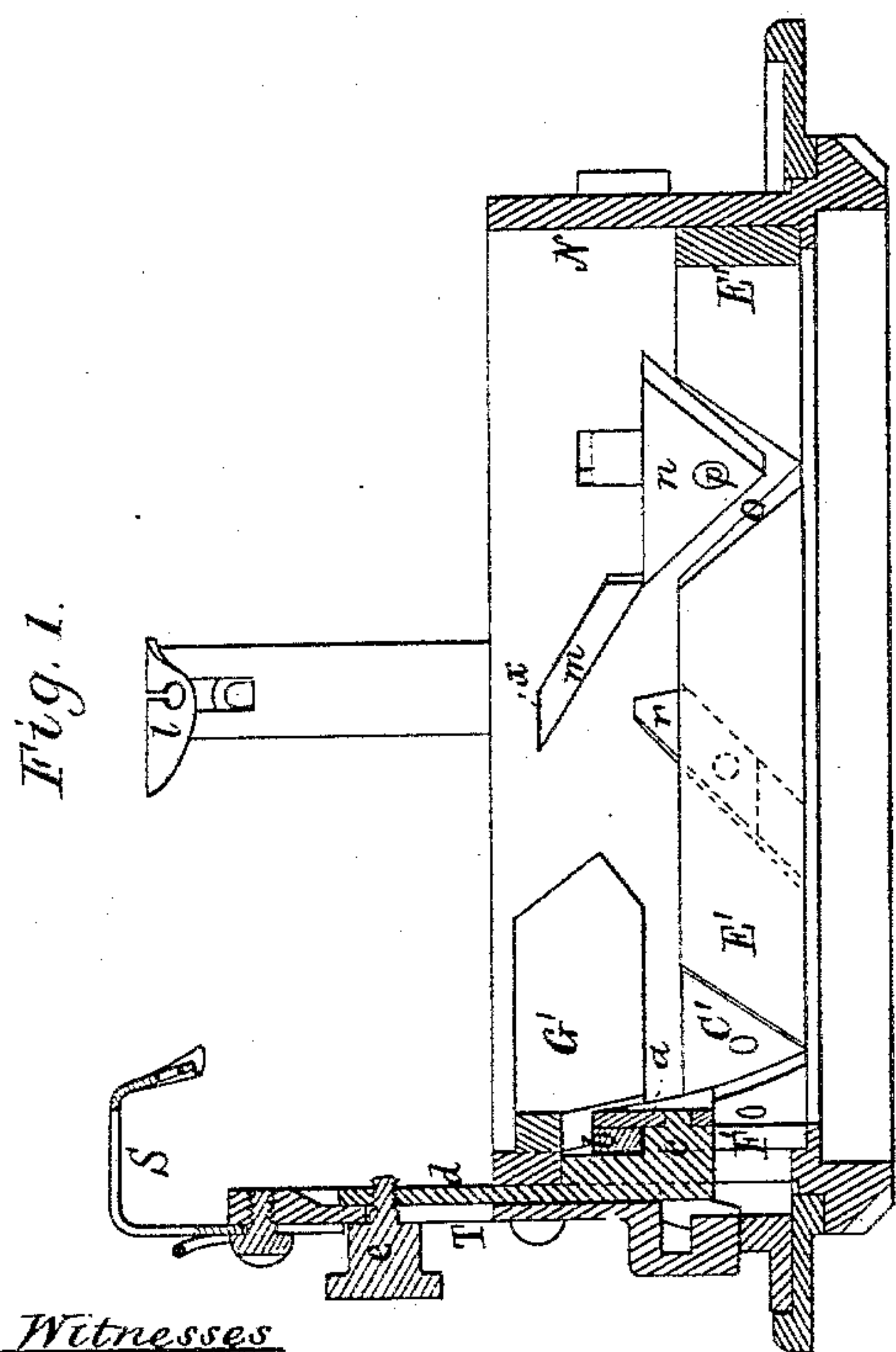
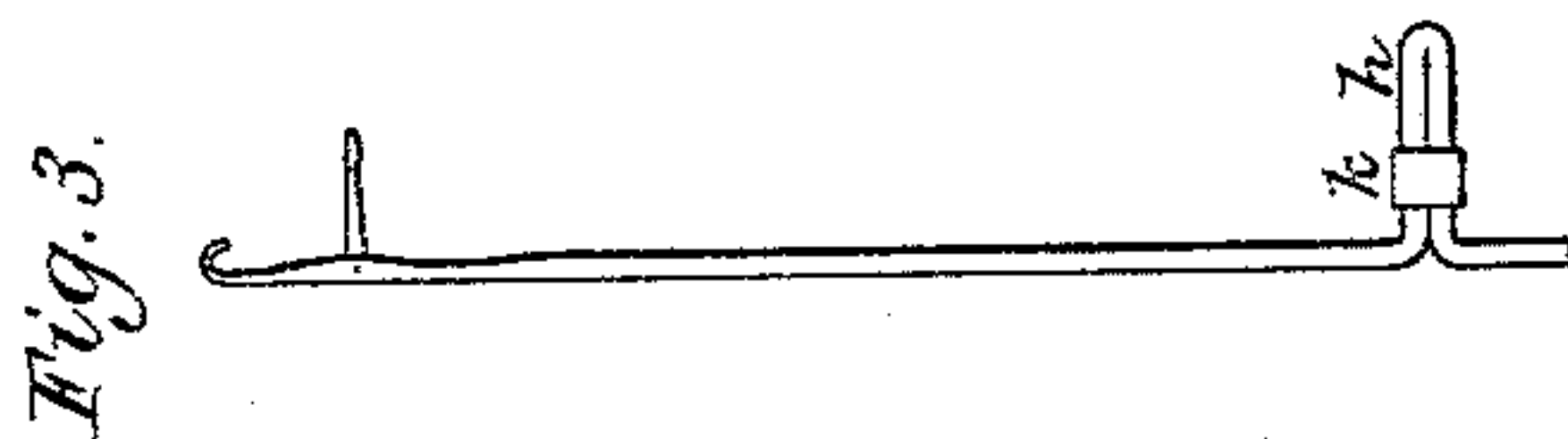
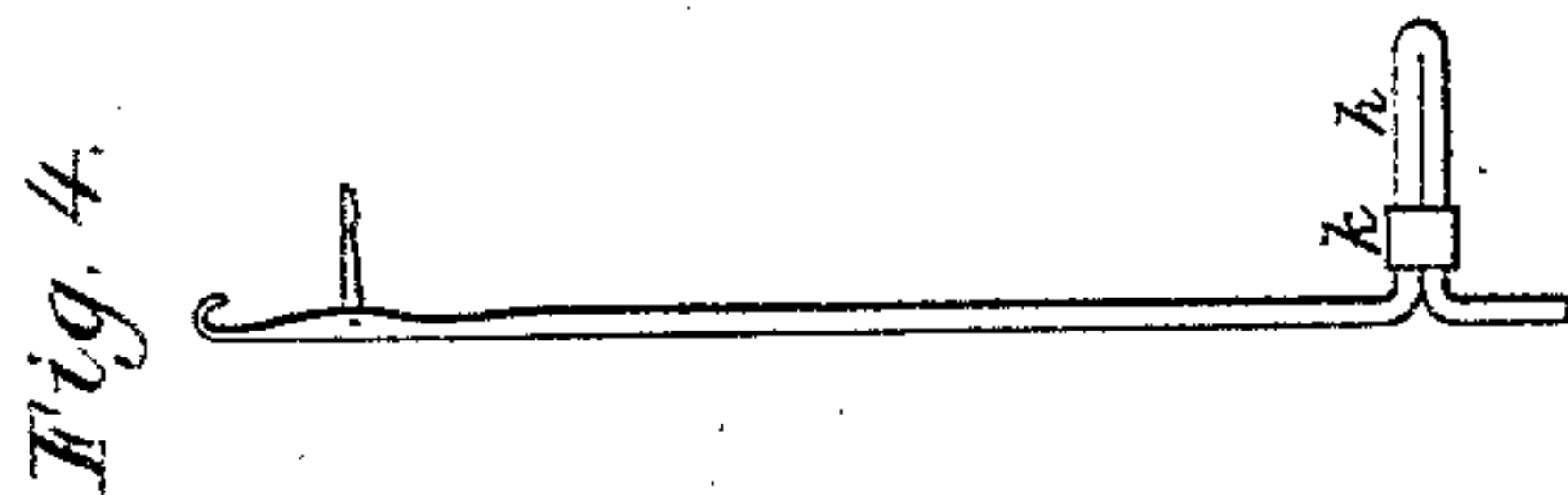
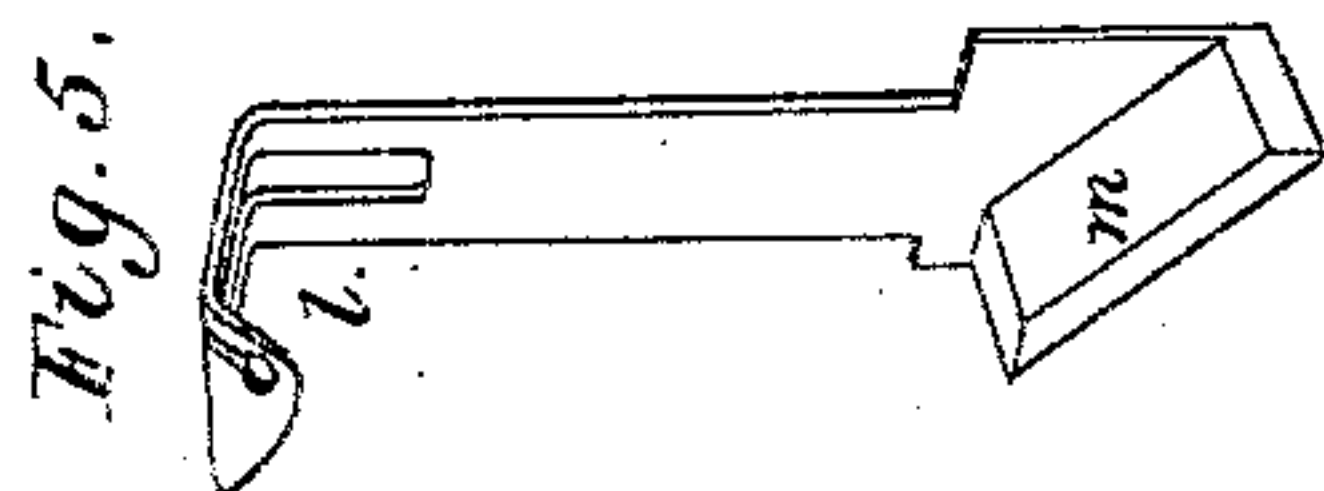
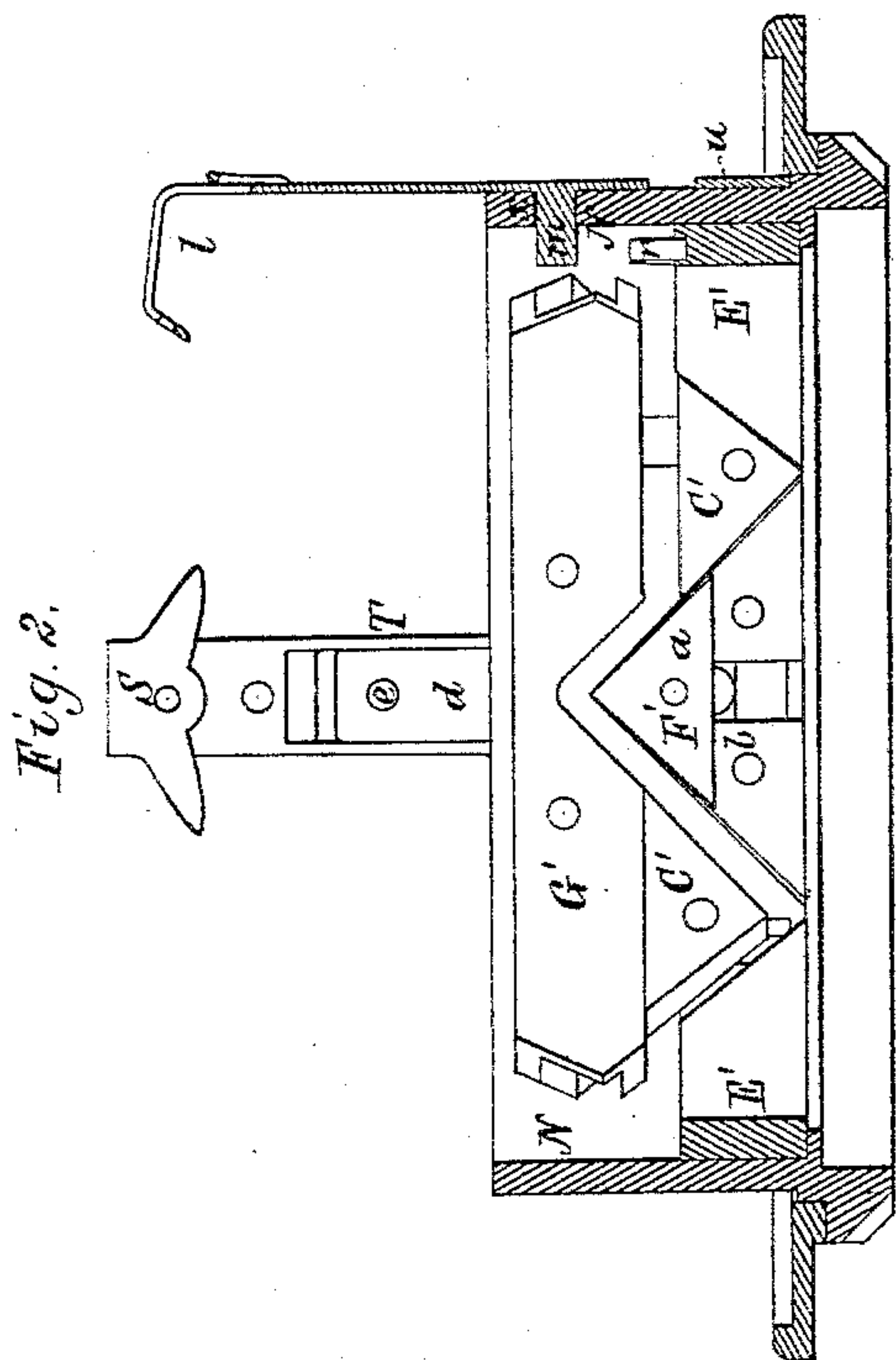
(No Model.)

2 Sheets—Sheet 1.

W. H. MAYO.  
KNITTING MACHINE.

No. 319,000.

Patented June 2, 1885.



Witnesses  
S. N. Piper  
E. P. Pratt,

Inventor  
Wm. Howe & Mayo.  
by R. H. Eddy atty.

(No Model.)

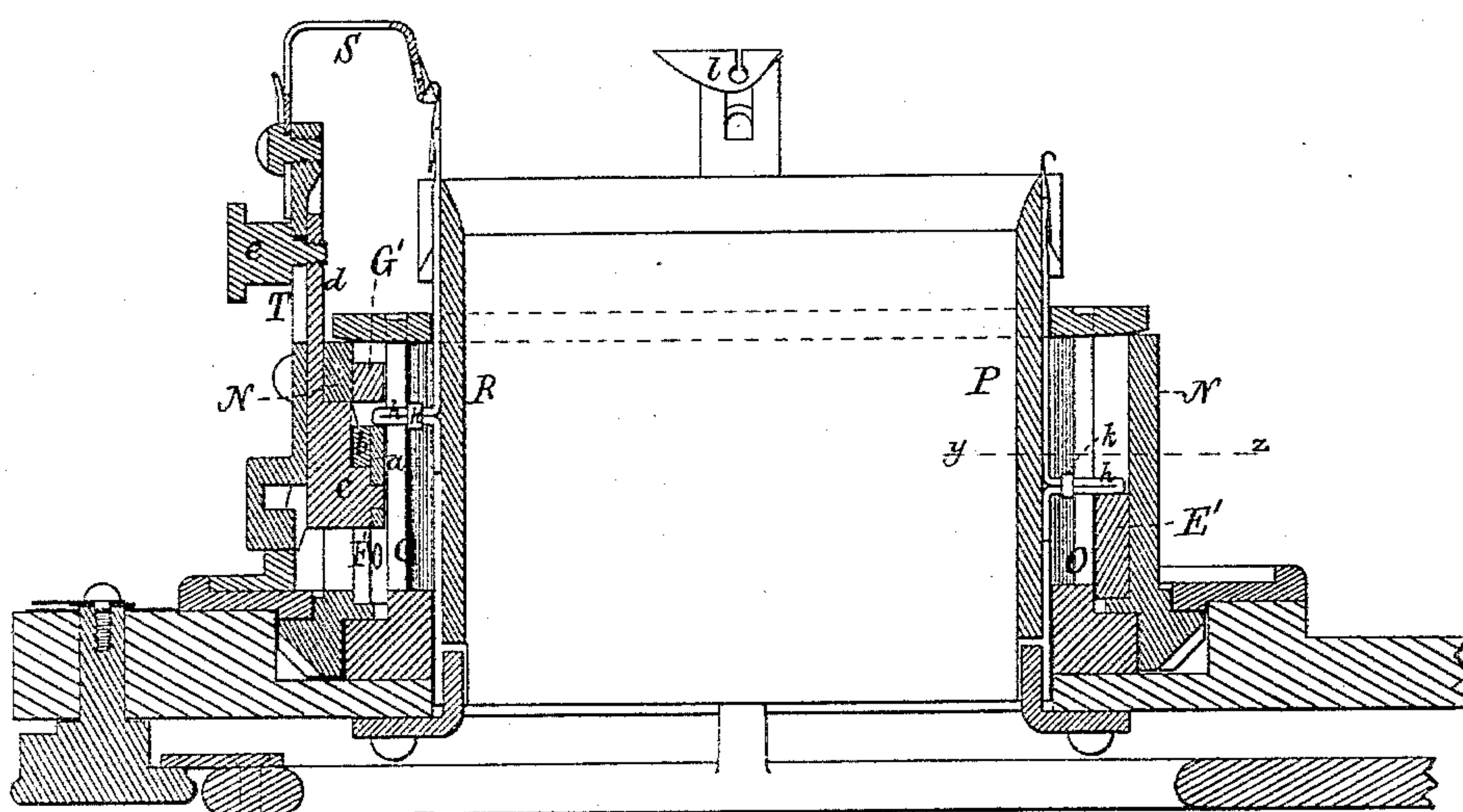
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W. H. MAYO.  
KNITTING MACHINE.

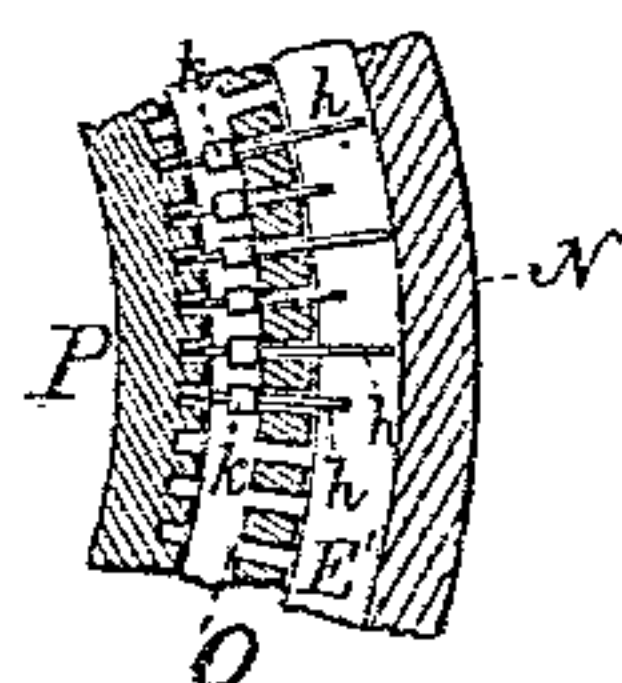
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*Fig. 7.*



*Fig. 8.*



Witnesses.

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# UNITED STATES PATENT OFFICE.

WILLIAM HOWES MAYO, OF LYNN, MASSACHUSETTS.

## KNITTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 319,000, dated June 2, 1885.

Application filed March 19, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM HOWES MAYO, of Lynn, in the county of Essex, of the Commonwealth of Massachusetts, have invented a new and useful Improvement in Machinery for Knitting; and I do hereby declare the same to be described in the following specification and represented in the accompanying drawings, of which—

Figures 1 and 2 are transverse sections of the cam-cylinder of a knitting-machine embracing my invention, the nature of which is defined in the claims hereinafter presented. Figs. 3 and 4 are side views of the long and short heeled needles. Fig. 5 is a perspective view of the auxiliary yarn-guide *l* and its inclined lip *m*, hereinafter described. Fig. 6 is side view of the cam-cylinder *N*, such figure showing the side plate, *u*, hereinafter explained. Fig. 7 is a vertical section of portions of a knitting-machine, showing the cam-cylinder in its due relation with the needle and skeleton cylinders and needles, and the adjacent parts of said machine. Fig. 8 is a horizontal section, on line *yz* of Fig. 7 of portions of the "cam-cylinder," "skeleton cylinder," "needle-cylinder," and needles.

The improvement relates to a machine of the kind described and represented in the United States Patent No. 274,208, dated March 20, 1883, and granted to me, such improvement being to render the machine capable of knitting plain or fancy stitch, the machine as represented in the said patent being capable of knitting the plain stitch only.

In the drawings, *N* denotes the cam-cylinders; *C* and *C'*, the vertically-movable wedge-shaped stitch-cams located within such cylinder, and adapted to be reciprocated in V-shaped recesses formed in the ledge *E'*.

*G'* is the guide-plate, located above the said cams *C* *C'* and the needle-elevating plate or cam *F'*. In the patented machine the cam *F'* was stationary; but in my present invention this cam is in two parts, *a* *b*, one of which is stationary and fixed to the cam-cylinder *N*, while the other is movable vertically on the stationary one. Each part *a* *b* is triangular in shape, their upper angles being alike. The inner part, *a*, is fixed to a projection, *c*, from a vertical slider, *d*, arranged on the outside of

the cylinder *N*, and adapted to slide vertically in the sustaining post *T* of the yarn-guide *S*. A clamp-screw, *e*, properly applied to the slider *d* and to the post *T*, serves to hold the part *a* either up with its two inclined edges even with those of the part *b* or down below such. When the part *a* is raised up even with the part *b*, both the long and the short heeled needles, in passing the cam *F'*, will ride over it; but when the part *a* is depressed to its lowest position the long-heeled needles only will pass upon and be raised by the part *b*, each short-heeled needle in passing the part *a* not being raised by it sufficiently to take the yarn in order to form a stitch. By such means I am enabled to vary the knitting so as to use only the long-heeled needles or both the long and the short heeled needles in forming it.

The needle-sustaining cylinder is represented at *P*. Its needles (shown in Figs. 3 and 4, and also in Figs. 7 and 8) have the heel *h* of one longer than that of the other. The said heels after passing the cams run upon the upper edge of the ledge *E'*. Each long-heeled needle has its heel only sufficiently long for it to run on the part *a*. Thus it will be seen that when the part *a* is depressed to its lower position the heels of the long-heeled needles only in passing the cam *F'* will be raised by its part *b*.

There is upon each heel of the needle a collar, *k*, which is a flat ring encompassing the heel and soldered to it. This collar, by bearing against the two fingers of the skeleton cylinder *O*, between which the heel extends when the needle is in place, serves to keep the needle from tipping out of position, and besides answers to strengthen the heel.

An auxiliary yarn-guide, *l*, extends up from the cam-cylinder *N*, there being fixed to the lower part of such guide an inclined lip, *m*, which is specially shown in Fig. 5. This lip extends through a correspondingly-shaped slot, *x*, in the cylinder *N*, so as to project inward beyond the inner periphery thereof a distance equal to the width of the ledge *E'*. The auxiliary yarn-guide may be held in place by any suitable movable fastening, such as a turn-button or a screw, *l'*.

Next to the lower end of the lip *m* is a stitch-cam, *n*, triangular in shape, and arranged in a



corresponding recess, *o*, in the ledge *E'*. This cam is so adapted to the cylinder *N* as to be capable of being raised in the recess in a manner to bring one side of the cam in range with the lower edge of the lip, the cam being provided with a clamp-screw, *p*, to hold it in either of its positions. When the cam is down within the recess, the upper edge of the cam is even with that of the ledge *E'*.

Aside of the lip is another movable cam or inclined plane, *r*, it being arranged in the ledge, adapted to slide upward from the upper edge thereof. From this cam and from the cam *n* studs or screws *p* extend into inclined slots *t t* in a slide-plate, *u*, applied to the outer periphery of the cam-cylinder *N*. (See Fig. 6.)

By moving the slide-plate one way lengthwise of it both cams will be simultaneously raised or forced upward above the top of the ledge. A movement of the slide-plate in the opposite way causes both cams to be depressed below the upper edge of the ledge. When these cams are raised, they with the lip cause the several needles in passing them to take the yarn from the auxiliary yarn-carrier and perform plain-stitch knitting. When the cams are depressed, the needles will pass them without producing any such knitting.

From the above it will be seen that besides the stitch produced by having the long-heel needles to be operated only by the cam *F'* in passing it I can have all the needles operated to make plain-stitch work before any of them may again pass the cam *F'*. Thus with my present improvement I can accomplish knit-

ting with all or part of the needles in passing the cam *F'*, and subsequently plain-stitch knitting when they may pass the auxiliary cam, and by depressing the cams *n* and *r* down to a level with the top of the ledge such plain-stitch knitting will not be performed as the needles may pass over them.

I have not deemed it necessary to illustrate and describe other parts of the machine to which my invention appertains, as they are duly represented and explained in the patent hereinbefore mentioned.

I claim—

1. The cam *F'*, constructed in two sections, *a* and *b*, and having one, *a*, of them movable vertically and the other stationary, in combination, and so as to operate, substantially as described, with the long and short heel needles, as represented.

2. In combination with the cylinder *N*, and with its cam *F'*, constructed in two sections, *a* and *b*, and having one of them movable and the other stationary, as described, the auxiliary yarn-guide *l* and the lip *m* and two movable cams, *n* and *r*, arranged and applied substantially in manner and provided with mechanism for operating them as set forth.

3. The heeled needles provided with the collars on their heels, as explained, in combination, and arranged with the needle and skeleton cylinders as set forth.

WILLIAM HOWES MAYO.

Witnesses:

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E. B. PRATT.