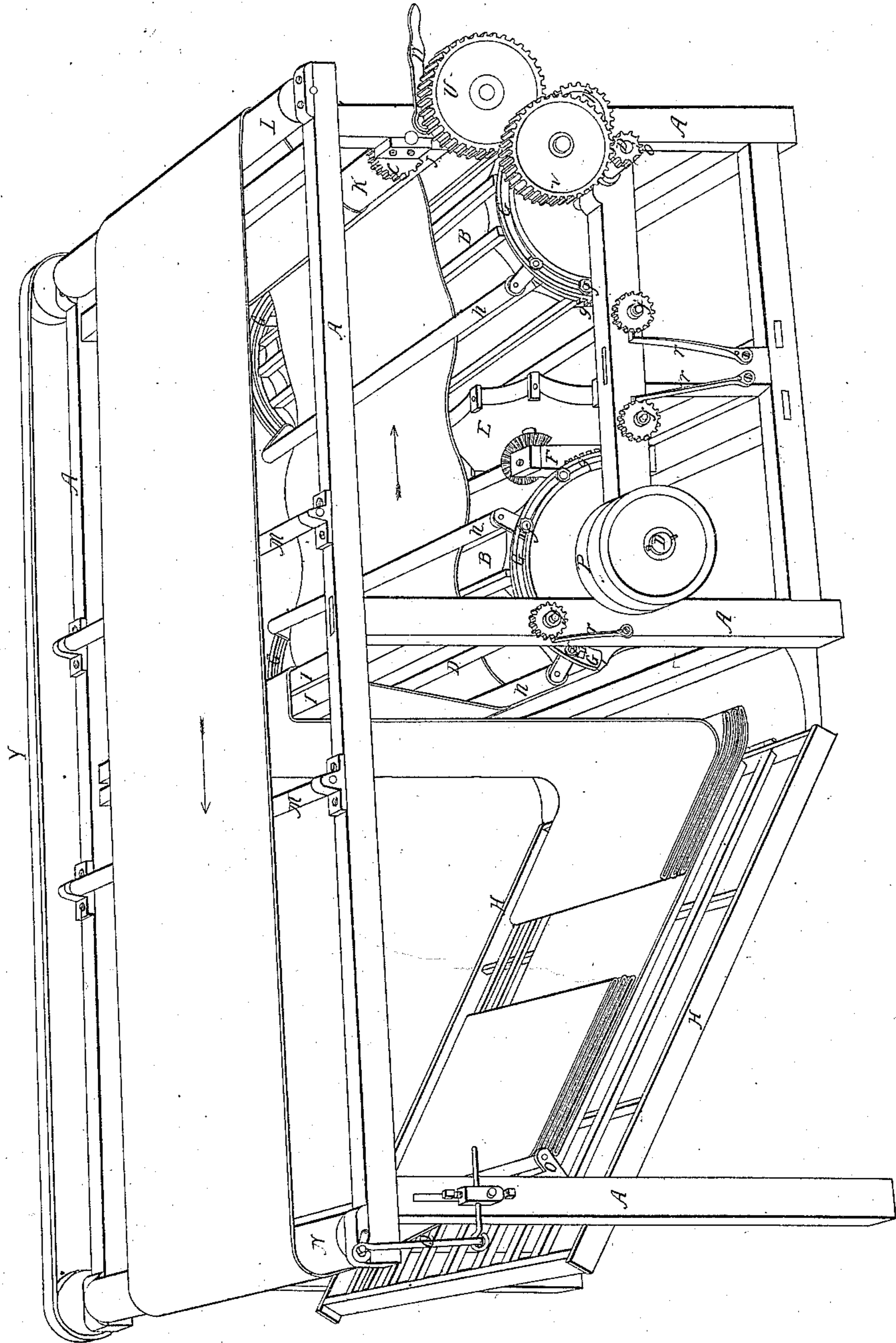


Miller & Tyler.  
Mowing Mach.

N<sup>o</sup> 17,227.

Patented May 5, 1857.

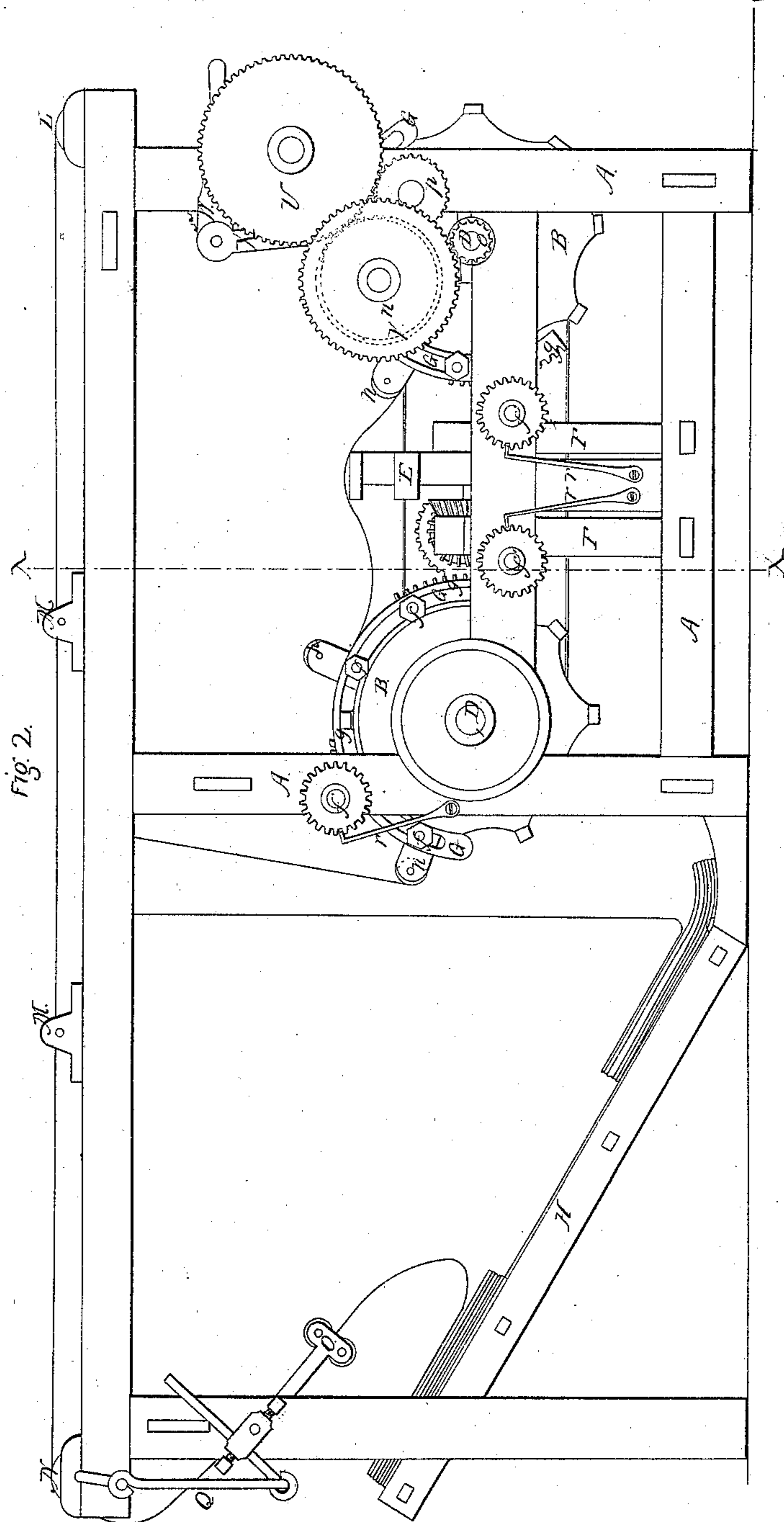
Fig. 1



Millar & Tyler  
Napping Mach.

N<sup>o</sup> 17, 227.

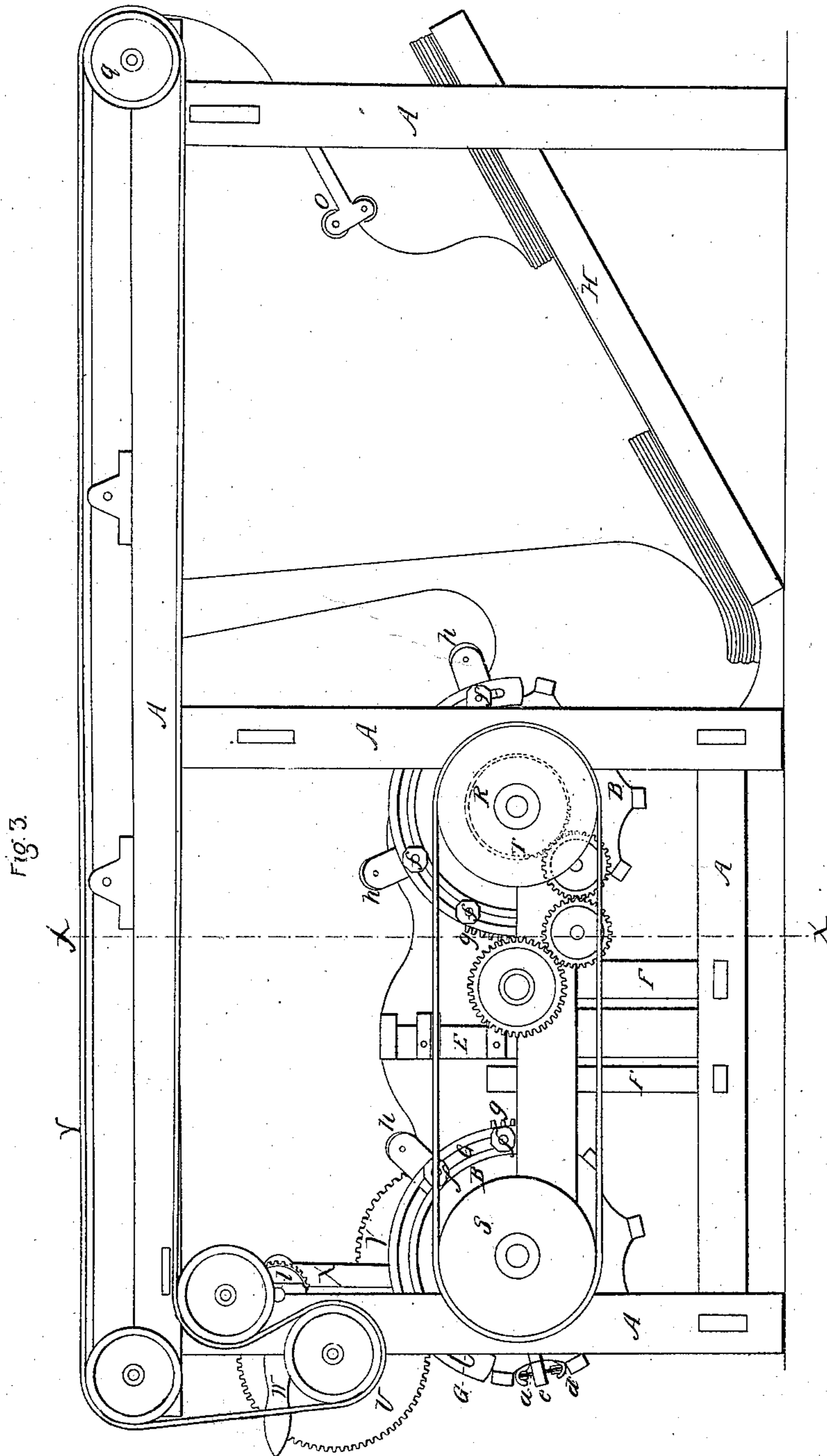
*Patented May 5, 1857.*



Millar & Tyler.  
Napping Mach.

N<sup>o</sup> 17,227.

Patented May 5, 1857.



# Millar & Tyler. Napping Mach.

N<sup>o</sup> 17,227.

Patented May 5, 1857.

Fig 5.

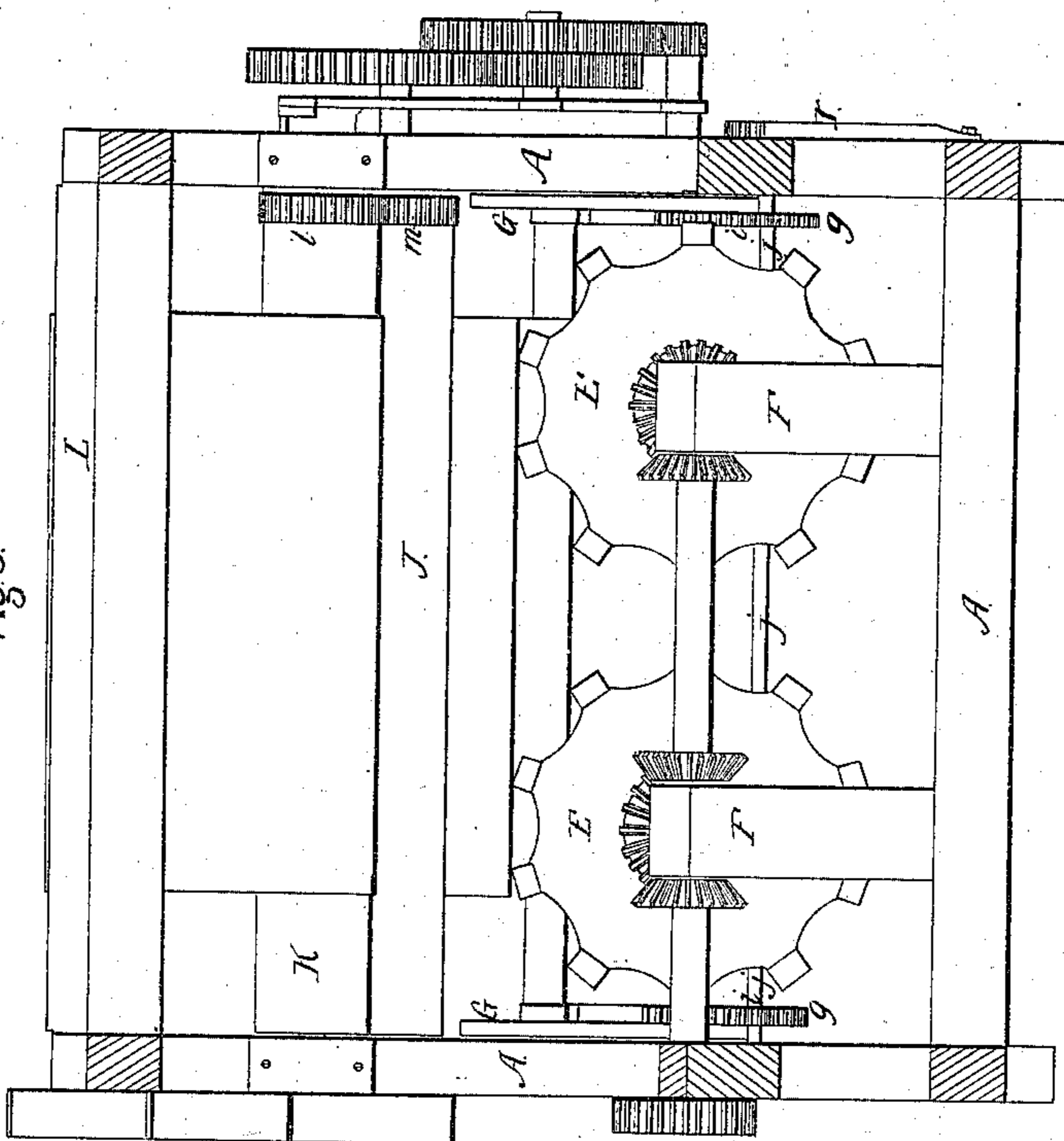
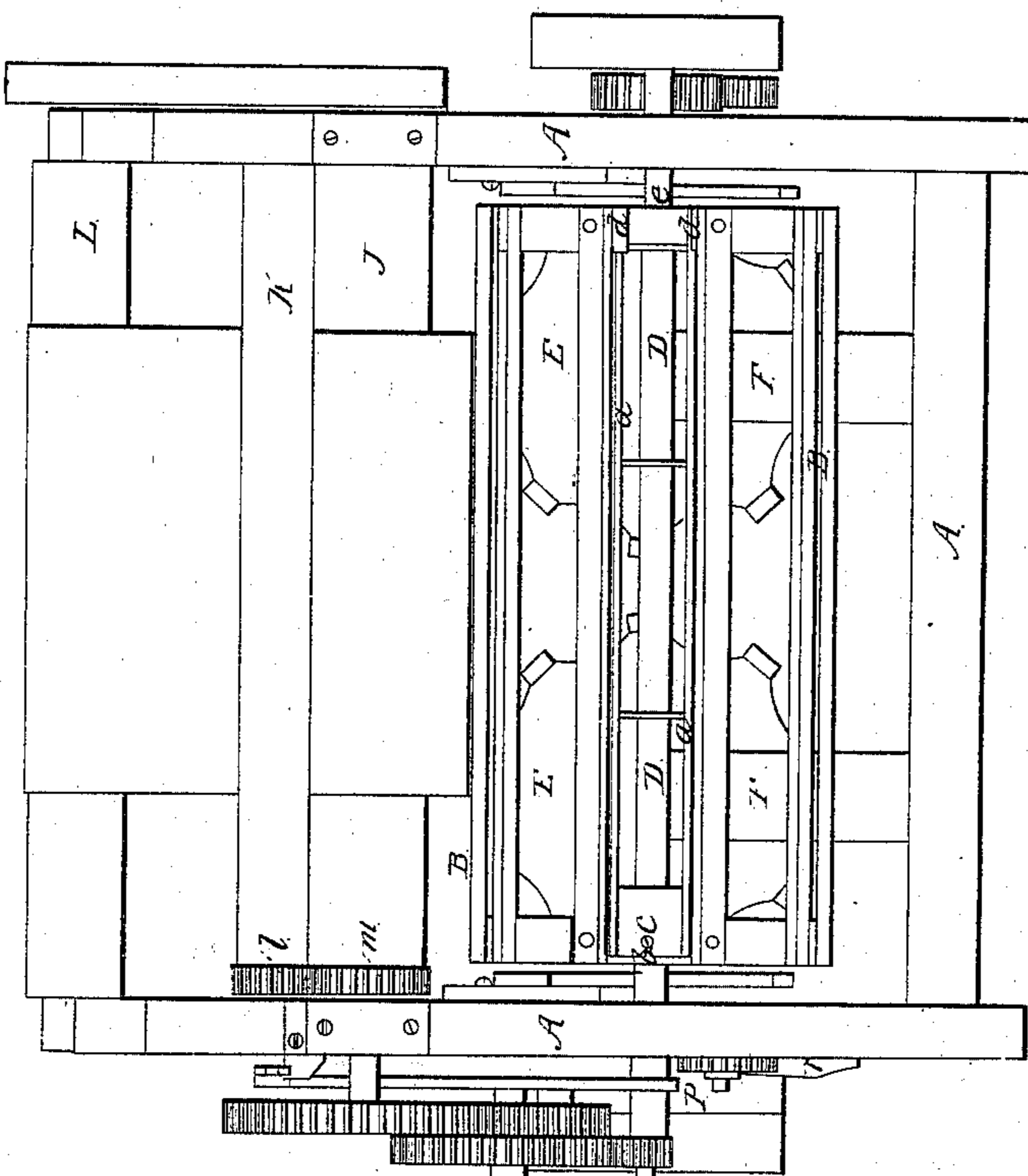


Fig 4.



# UNITED STATES PATENT OFFICE.

JOHN C. MILLAR, OF STARUCCA, PENNSYLVANIA, AND CHARLES N. TYLER,  
OF WASHINGTON, DISTRICT OF COLUMBIA.

## IMPROVEMENT IN MACHINERY FOR NAPPING CLOTH.

Specification forming part of Letters Patent No. 17,227, dated May 5, 1857.

*To all whom it may concern:*

Be it known that we, JOHN C. MILLAR, of Starucca, county of Susquehanna, and State of Pennsylvania, and CHARLES N. TYLER, of Washington, in the District of Columbia, have invented certain new and useful Improvements in Machines for Raising the Nap of Cloth, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings of the same, in which—

Figure 1 represents a view in perspective of a machine embracing our improvements; Fig. 2, a side elevation of the same, and Fig. 3 a similar view of the other side of same. Fig. 4 represents an end elevation of the rear of the machine; and Fig. 5, a transverse vertical section of the machine through the lines *x x* of Figs. 2 and 3, looking toward the rear of the machine.

Our improvement consists in the combination and arrangement of two or more napping or teaseling cylinders in a horizontal plane, whereby the cloth intended to be napped is submitted to the action of two or more sets of teasels each time it is caused to pass through the mill, thus economizing time and labor.

Another and perhaps more important advantage arising from the use of such a combination is that it enables the operator so to rotate the cylinders as to teasel the cloth in opposite directions simultaneously, thereby materially hastening the process.

Notwithstanding the advantages arising from the combination of two or more cylinders revolving in the direction of the warp of the cloth, it is still a matter much to be desired to be able yet further to expedite and cheapen this tedious and costly process, to which end we find that by combining two or more teaseling-disks or an endless apron or belt provided with teasels with the napping-cylinders, but so arranged as to revolve in a line, or nearly so, with the weft of the cloth, the process is not only much hastened, but the quality and finish of the cloth much improved.

Our invention further consists in a new method of securing the gig-rods to which the teasels are attached to the cylinders, they heretofore having been merely slipped into the slides without any means being provided

to retain them in their position, their tendency being to work loose, to the great damage both of the machine and cloth, to remedy which we cut a notch in one end of the rod of a width sufficient to embrace the shank of a screw-bolt in the head of the cylinder, the head of the bolt retaining that end of the gig-rod securely in its position, while the other is secured by means of a spring-plate pivoted near the center of the other cylinder-head, the upper side of that end of the gig-rod being confined between the lips of the guide-plate; or, instead of a separate spring-plate for each, a disk having a series of radiating-arms equal in number to the gig-rods may be mounted upon the shaft of the cylinder in such manner as to be free to be turned upon its axis, so that the gig-rods may be removed, replaced, and again secured, as may be desired.

In the accompanying drawings, A A represent the frame-work of the machine, upon the cross-beams of which are arranged and mounted in suitable bearings two hollow-ribbed cylinders B B in a horizontal plane, between the ribs of which are secured the gig-rods *a*, to which the teasels are attached, the gig-rod having for this purpose a notch *b* cut in one end to embrace the shank of the bolt *c*, whose head confines that end of the rod to the head of the cylinder, the other end of the rod being confined to the opposite head of the cylinder between the lips of a bracket *d*, secured to the head and prevented from sliding outward by a spring-plate *e*, of which there are a series on every cylinder, one for each gig-rod, the plates *e* in this instance being pivoted near and in a radial line with the shafts D of the cylinders, so that they may be turned aside and the rods withdrawn and turned back again when replaced.

Between the two teaseling-cylinders B, but so arranged as to operate at right angles to the plane of motion of the former, are mounted two teaseling-disks E in suitable bearings in standards F, erected upon cross-beams of the lower frame-work. These disks are intended to cross-nap the cloth as it comes from under the action of the first napping-cylinder, it having been napped by it in the direction of the warp of the cloth, so that when the latter is brought to the second cylinder it will, in-

stead of being napped in the same line as the last, be submitted to the action of teasels operating at right angles thereto, whereby the process is materially hastened and the quality and finish of the goods enhanced, from the fact that both the warp and the woof have been properly napped. These disks E may either be arranged in line with each other or so as to overlap, but as a general thing will be used in the former manner, as experience shows that cloth becomes napped sooner in the center than toward the edges, so that it will not be as necessary in cross-napping it to raise it in the center as toward the sides; but those deeming it absolutely essential to cross-nap over the whole width may so arrange them as to overlap each other for this purpose, and in such a case, if deemed advisable, three or more may be used instead of two; or, instead of using disks or wheels with teasels secured in the usual manner to their peripheries, an endless apron may be arranged between the cylinders B, having the teasels secured thereto, and driven and guided in any convenient manner over rolls for the purpose. This plan may be deemed best by those who consider it necessary to cross-nap over the whole width of the cloth, while those who consider it unnecessary to cross-teasel the central part of the web of cloth will prefer to use the teaseling disks or wheel.

To the inside of the side beams of the framework upon which the cylinders B are mounted are secured the inner ends of semicircular slotted guideways G—four in number—arranged one at each head of the cylinders. Through the slots of these guides pass bolts *f*, which secure the carriages *g* thereto, having lugs projecting therefrom, on which are mounted rolls *h*, which confine the cloth to the action of the teaseling-cylinders, the forward cylinder being provided with two rolls, each of which is capable of adjustment by means of a rack formed on the exterior periphery of every carriage, each of which takes into a pinion *i*, mounted upon either end of a shaft *j*, by the turning of which the carriage is caused to traverse upward or downward in the slot of the guide G, as the case may be, for the purpose of raising or lowering both ends of the rolls simultaneously, the object of which is to loosen or confine the cloth more closely to the action of the teasels, as may be desired; or, in the event of one side of the cloth becoming more speedily napped than the others, which not infrequently happens from differences in the quality of the teasels that side of the rolls next the finished side may be raised to loosen it, while the other is kept in close contact with the teasels until finished. Upon the rear cylinder is arranged another roll *h*, mounted and operated in the same manner as the rolls *h*, above described, the rolls *h* when once adjusted being retained in position by means of pawls *r*, which take into rack-wheels *f'*, secured upon the shafts *j*.

Upon the platform H is placed the cloth to

be napped, it being curved at its lower extremity, so as to throw up the lower edge of the cloth and render it easier to be fed and jointed, so as to preserve this position as the platform is more or less inclined, the outer end of the latter being supported upon adjustable lugs for this purpose. One end of the cloth is then passed over two straightening-beams I, which may be so made as to approach or recede from each other, as may be desired, they being slightly rounded on their outer edges in order to take out any wrinkles or creases in the cloth, which is then conducted over the cylinders B, between them and the rolls *h*, and made to turn round a draw-roll J, thence round another K, having a pinion *l*, gearing into a pinion *m* of the former, thence over the roll L, and from it over the friction-rolls M and round the draw-roll N at the farther end of the machine, from which it is conducted down between the rolls of the folder O, where it drops upon the platform and is there connected with the other end of the cloth, so as to form an endless belt. The rolls *h* being then properly adjusted, the machine is ready to commence operations by changing the belt from the loose to the fast pulley P and communicating motion to the latter, so as to cause it to revolve in opposite direction to the motion of the cloth, as indicated by the arrows, the folder being operated by a pitman-rod Q, attached to a crank secured to the shaft of the draw-roll *n*. As the first cylinder B revolves it communicates motion to the second by means of a belt passing around pulleys R and S, secured upon their shafts, respectively, motion being also communicated to the teaseling-disks E in such manner as to cause them to revolve in an outward direction by means of a spur-wheel T, secured upon the shaft of the first cylinder between the pulley and the frame through suitable intermediate gearing and the bevel-wheels secured upon their shafts. When the cylinders both rotate in one direction, the spur-wheel U, in order to make the draw-rolls revolve in the proper direction, is made to gear with the small wheel *n*, mounted upon the same shaft as the spur-wheel V, which receives motion from the pinion *o* on the shaft of the cylinder, as shown in Fig. 1; but when caused to rotate in different directions the spur-wheel is then thrown into gear with the pinion *p*, as shown in Fig. 3, for the same purpose, by means of the lever W, which is jointed to the upper end of the standard X, upon which the spur-wheels *n* and *p* are mounted, its lower end being mounted upon the shaft of the first cylinder in such manner as to be free to oscillate thereon. Into the lower side of this lever are cut notches which engage with a catch secured to the standard of the frame, by which they are kept securely in position.

Y is the belt which communicates motion to the draw-rolls.

Having thus described our invention, what

we claim as new, and desire to secure by Letters Patent, is—

1. The combination and arrangement of two or more napping-cylinders, in the manner substantially as and for the purposes described.

2. The teasinging-disks E or their equivalents, in combination with the cylinders B, when arranged in the manner and for the purposes substantially as set forth.

3. The method herein described of securing

the gig-rods *a* to the cylinders, for the purposes set forth.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

JOHN C. MILLAR.  
CHARLES N. TYLER.

Witnesses:

P. HANNAY,  
ARTHUR C. WATKINS.