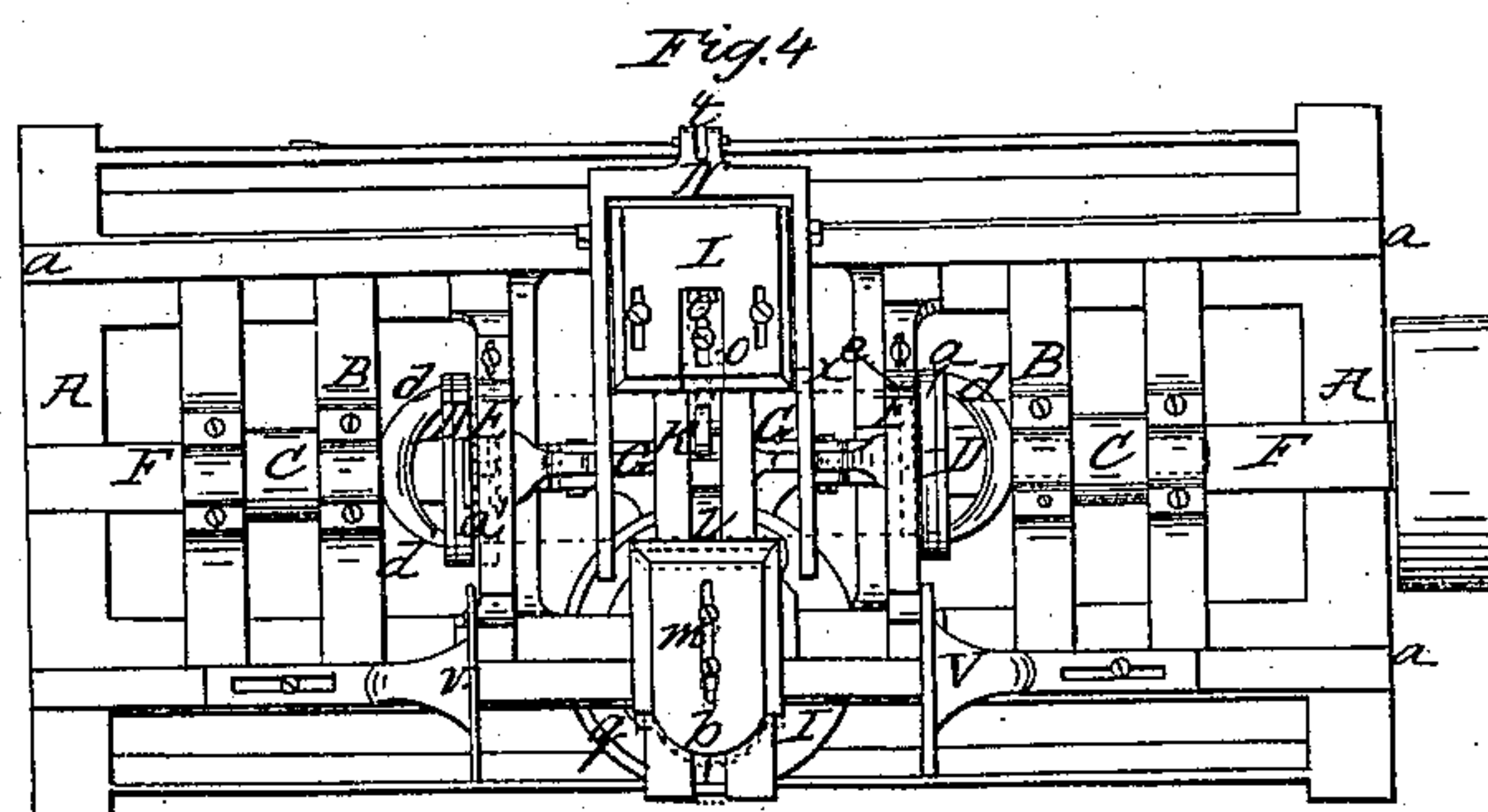
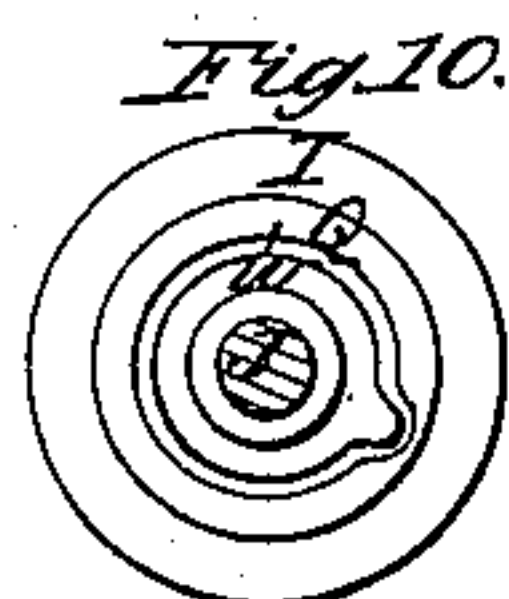
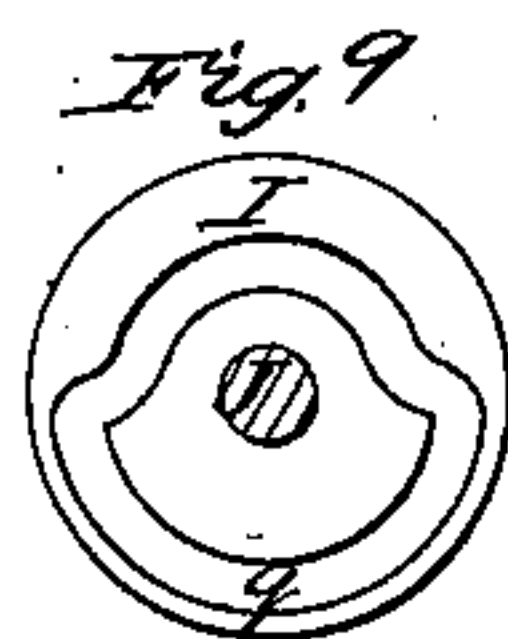
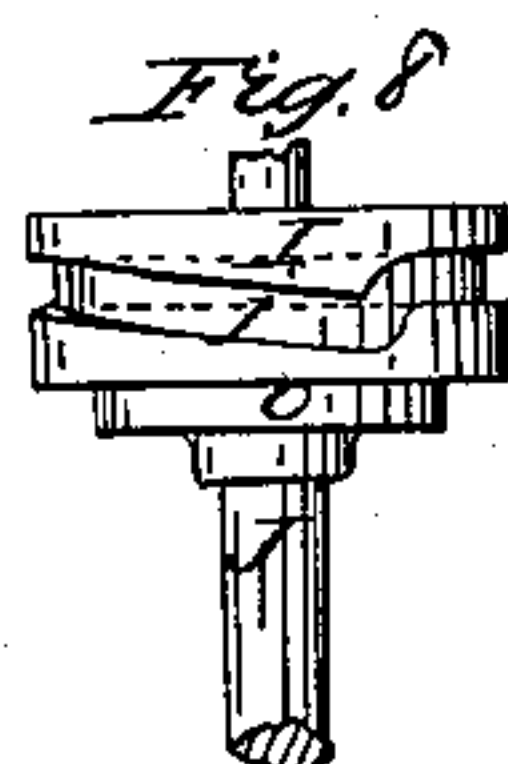
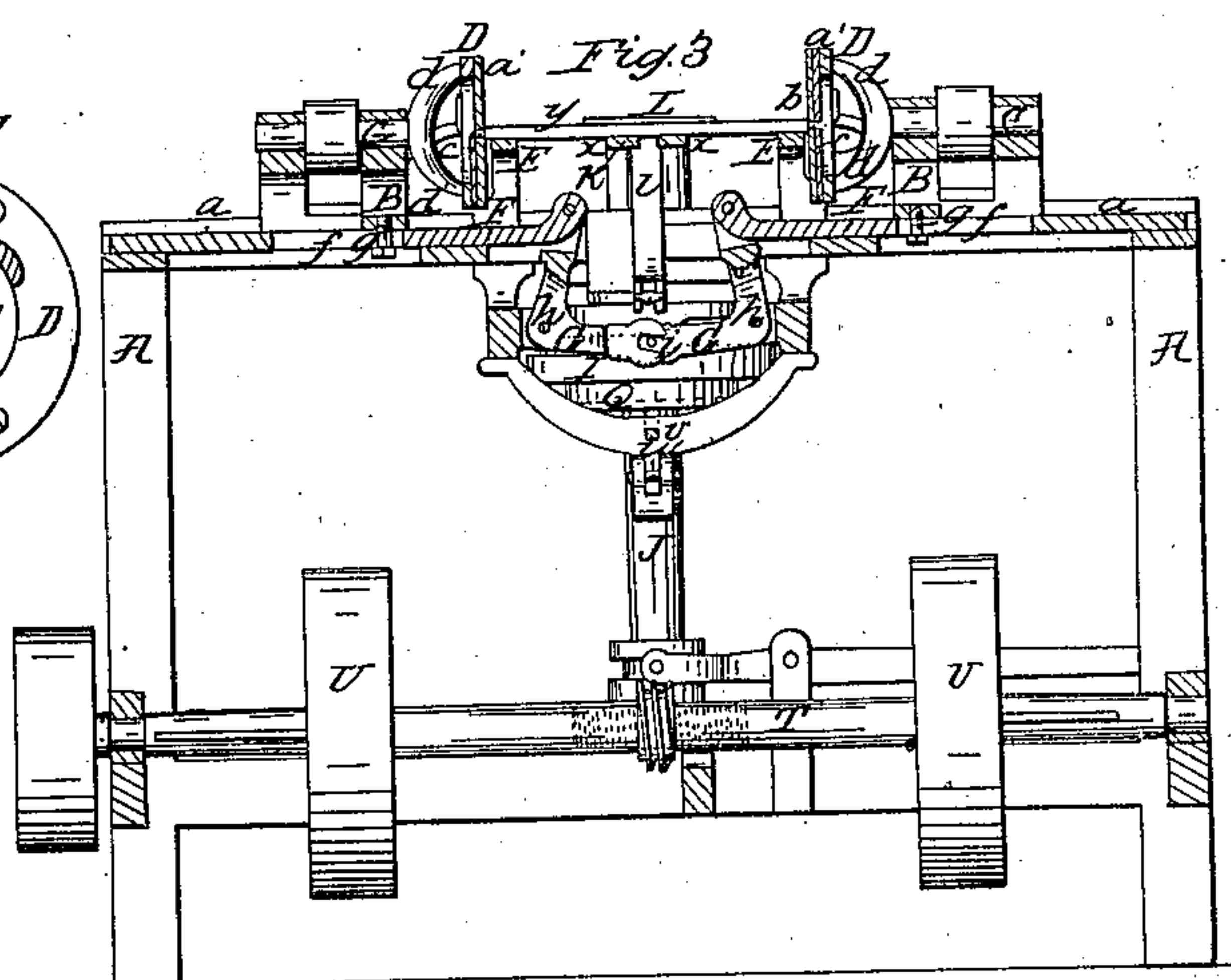
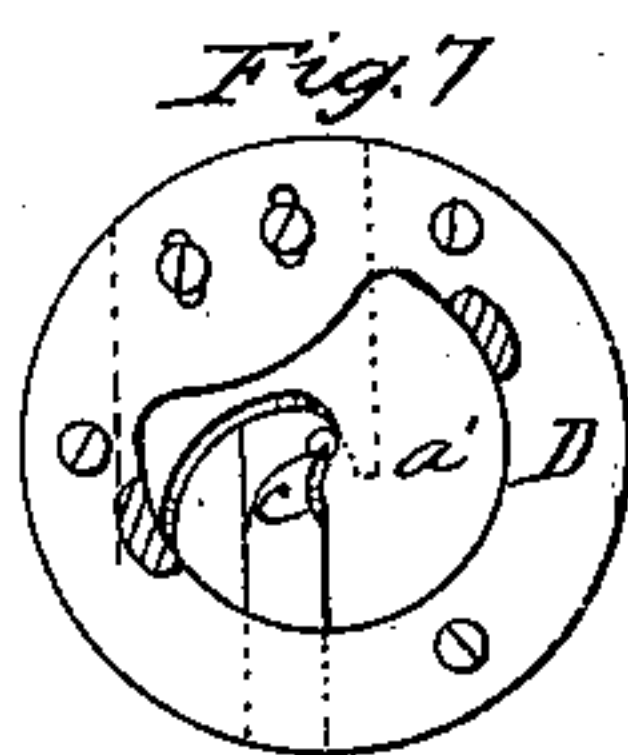
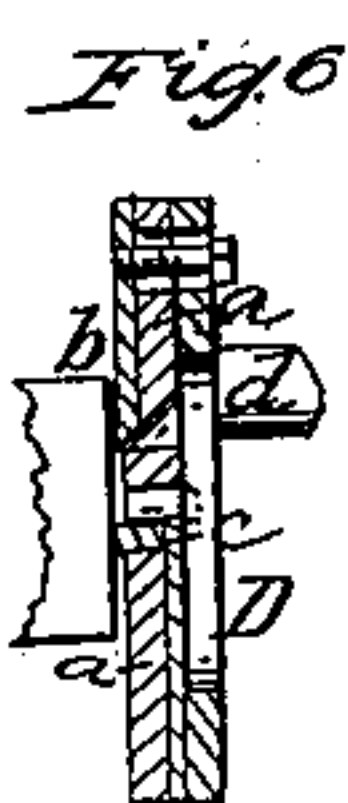
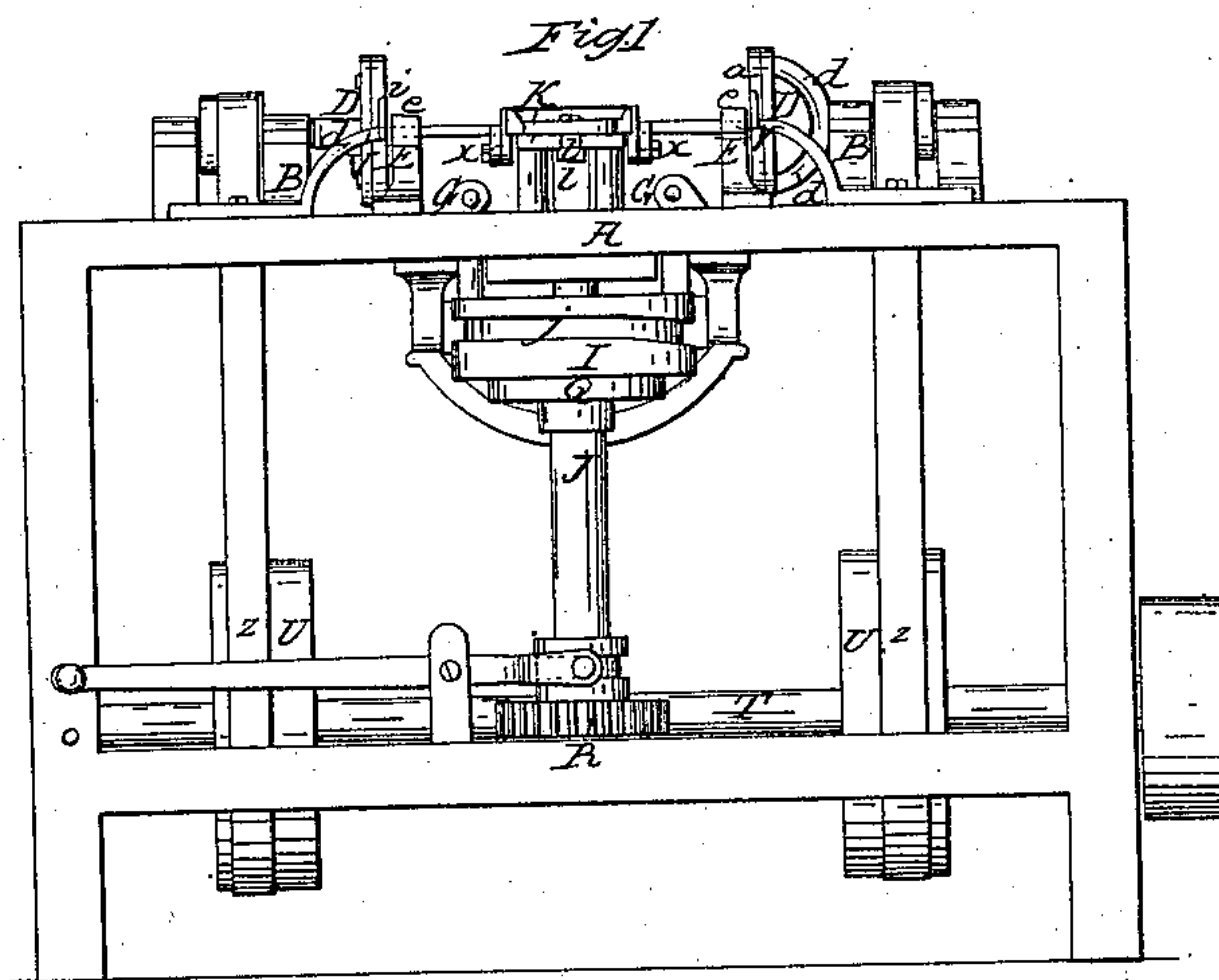


## *Tenoning Blind Slats, &c.*

*Patented Feb. 20, 1855.*





# UNITED STATES PATENT OFFICE.

JOEL HASTINGS, JAMES RAMSAY, AND H. G. CHAMBERLAIN, OF ST. JOHNSBURY, VERMONT.

## MACHINE FOR CUTTING TENONS.

Specification of Letters Patent No. 12,416, dated February 20, 1855.

*To all whom it may concern:*

Be it known that we, JOEL HASTINGS, JAMES RAMSAY, and HENRY G. CHAMBERLAIN, of St. Johnsbury, in the county of Caledonia and State of Vermont, have invented certain new and useful Improvements in Machinery for Tenoning Blind-Slats and Articles of Similar Character; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1, is a front view of a tenoning machine constructed according to our invention; Fig. 2, is a transverse vertical section of the machine; Fig. 3, is a longitudinal central section of the same, and Fig. 4, is a plan of the same. Fig. 5, is a face view of one of the cutter stocks of the tenon heads; Fig. 6, a central section, and Fig. 7, a back view of the same. Fig. 8, is a side view of the cams which give the longitudinal movement to the tenon heads, and operate the clamps which hold the slat while being tenoned and a fly which discharges the tenoned slats from the machine; Fig. 9, is a top view, and Fig. 10, a bottom view of the same.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to the peculiar arrangement of the tenon heads the apparatus by which the slats are held to be submitted to their operation, and the apparatus by which the tenoned slats are discharged from the machine; to the peculiar construction of the tenon head and arrangement of the cutters; and to certain novel means of discharging the tenoned slat from the machine.

To enable those skilled in the art to make and use our invention we will proceed to describe its construction and operation.

A, is the framing of the machine on the upper part of which are straight dovetail slides  $a, a$ , to receive the two tenon heads B, B, which are capable of sliding freely therein. These tenon heads carry the cutter shafts C, C, and their cutter stocks and cutters. The cutter stocks are made in two parts, one of which D, is in the form of a ring or flanch and connected with the shaft by means of two arms or a yoke  $d, d$ , and the other consists of a disk  $a'$ , having an opening in the center large enough to allow the

largest size tenon to pass easily through it. The flanch D, and disk  $a'$ , are bolted together and the disk  $a'$ , has bolted to its front side, the curved edge cutter  $b$ , which cuts down the shoulder of the tenon, and to its back side, the spur cutter  $c$ , which cuts off the end of the tenon to the proper length. The above described method of constructing the cutter stock, by allowing plenty of free open space at the back, affords sure provision against the choking of the cutters by the shavings, and also affords great facility for attaching the two cutters  $b$ , and  $c$ , in the proper planes, as it is intended that the disk  $a'$ , shall be of a thickness nearly equal to the length of the tenons. Each tenon head has secured to or cast with it, a rest E, which supports the slat at the proper height for the cutters, and on these rests are adjustable stops  $e, e$ , against which the slat is placed, when laid upon the rests. The tenon heads are bolted to two slides F, F, which are fitted to slide easily in dovetail grooves on the top of the framing under the centers of the heads, slots  $f, f$ , (see Fig. 3) being provided in the sliders to receive the bolts  $g, g$ , which attach them, in order that the tenon heads may be adjusted at any distance apart. The two sliders are connected with two similar elbow levers G, G, having fixed fulcra  $h, h$ ; the said elbow levers being connected with each other by a pin  $i$ , in one, working in a slot in the other, and the said pin  $i$ , working in a cam groove  $j$ , in the periphery of a barrel I, upon a vertical shaft J, which works in suitable bearings near the front of the machine, and at about the middle of the length thereof. This groove  $j$ , is of such form that during about one third of the revolution of the cam shaft J, it will by acting on the stud  $i$ , cause the sliders and the tenon heads to approach each other slowly and retreat quickly, and during the remainder of the revolution will keep them at the greatest distance from each other. The form of the groove  $j$ , will be understood by reference to Fig. 8, all that is not visible there being straight and at right angles to the axis.

K, is a transverse table supported at the center of the framing A, at the same level as the rests E, E, attached to the tenon heads. To the top of the table K near the back end, there is secured firmly an adjustable plate L, whose front end ranges nearly



in line, with, but not in advance of the stops *e, e*, on the rests *E, E*. In the middle of the said table, there is an open slide *k*, to receive a slider *l*, which carries an adjustable clamping piece *m*, and also another slider *n*, which carries a dog *o*, the said dog working in a recess in the plate *L*. The slider *l*, hangs down below the table nearly to the top of the barrel *I*, and carries a stud *p*, which works in a cam groove *q*, in the top of the said barrel. The same slider is also connected at *r*, with the lower end of a lever *M*, (see Fig. 2) which works on a fixed fulcrum *s*, and has its upper end connected with the slider *n*, of the dog *o*. This mode of connecting the slider *n*, of the dog *o*, with the slider *l*, of the clamping piece *m*, causes the former to advance to meet the latter when the latter moves toward the former, and causes both to retire from each other simultaneously. The cam groove *q*, acts upon the stud *p*, to give motion to the slider *l*, and it is of such form represented in Fig. 9, and so arranged relatively to the groove *j*, that while the tenon heads are approaching and retiring from each other the clamping piece *m*, and dog *o*, are stationary in their nearest position to each other, but that as soon as the tenon heads have retired from each other the said clamping piece and dog retire from each other, and that the approaching of the tenon heads shall be preceded by the approaching of the said clamping piece and dog. By this means the slat to be tenoned when laid on the table *K* during the retirement of the tenon heads is seized by the clamping piece and dog, and held thereby before the tenon heads approach each other to cut the tenons; and is not liberated until after the tenon has been cut and the tenon heads have again retired.

*N*, is the fly by which the slats are discharged from the machine after having their tenons cut. This fly consists of a light frame of the form of a two pronged fork, which is pivoted near its crotch to the sides of the plate *L*, the prongs *x, x*, standing on opposite sides of the table *K*, below where the slat is placed. This fork is connected, at its crotch, by a rod *t*, with the longer arm of an elbow lever *P*, which works on a fulcrum *u*, fixed in the framing, and has its shorter arm attached to one end of an elbowed rod *v*, which slides through a suitable fixed guide and has its other end working in a groove *w*, in the under side of a cam *Q*, which is secured to the shaft *J*, below the barrel *I*. The cam groove *w*, is of such form that once during its revolution, it will by its action on the sliding rod *v*, cause the rod *t*, to be pulled down suddenly and as quickly raised, and thereby cause the prongs *x, x* of the fly to be suddenly thrown up to the position shown in red in Fig. 2. And

immediately returned to the position shown in black in the same Fig: in which position it remains during the remainder of the revolution of the cam. The cam *Q*, is so arranged on the shaft relatively to the barrel *I*, that the above described movement of the fly takes place immediately after the slat has been liberated by the clamping piece *m*, and dog *o*, after the cutting of the tenons, the said movement being for the purpose of discharging the slat or throwing it from the machine as represented in Fig. 2, where the slat *y*, is shown in red color in the act of falling.

The shaft *J*, receives motion at a comparatively slow speed through a worm wheel *R*, which it carries near its lower end, and an endless screw *S*, on the horizontal shaft *T*, which is the main shaft of the machine, and carries in addition to the aforesaid endless screw, the two pulleys *U, U*, over which run the belts *z, z*, for driving the cutter shafts of the tenon heads.

On the top of the framing opposite the cutter stocks, are two gaging heads *V, V*, which are adjustable according to the length of the slats, for the purpose of serving as guides for the proper insertion of the slats in the machine.

The manner of operating with the machine is as follows. The tenon heads *B, B*, are adjusted at such positions on their respective sliders *F, F*, that when they have advanced nearest to each other their distance apart will be equal to the required length of the slat from shoulder to shoulder of the tenons. The gaging heads *V, V*, are set at a distance apart equal to or a trifle greater than the length of the whole slat before it is tenoned, and in such positions on the framing that when the slat is pushed between them on to the table *K*, during the retirement of the tenon heads, it will be in a suitable position to receive the operation of the tenon heads. The fixed plate *L*, and the clamping plate *m*, are so adjusted that when the said clamping plate and the dog *o*, have advanced nearest to each other the distance between them will be such as to grasp a slat tightly in the proper position with the parts to form its tenons opposite the axes of the cutter stocks. Rotary motion is given to the shaft *T*, by any prime mover and all the parts of the machine operate as above set forth. The slats are inserted one at a time by a person stationed in front of the machine, and pushed during the retirement of the tenon heads and opening of the clamping apparatus, between the gage plates *V, V*, on to the table *K*, being always pushed back against the stops *e, e*, which, it might have been before stated, are properly adjusted for the purpose. The clamping piece *m*, and dog *o*, advance and seize it, and the tenon heads immediately



approaching each other with their cutters in rapid revolution, cut down the tenons at both ends simultaneously. The retirement of the tenon heads and subsequent opening of the clamps then leave the slat free, and the fly N, coming immediately afterwards into operation throws it from the machine. The fly immediately afterwards resuming its position below the surface of the table K, leaves the machine in condition to receive the next slat, when the operation proceeds as upon the last one, and so continues as long as the machine is regularly supplied.

15 What we claim as our invention and desire to secure by Letters Patent is

1. The arrangement of the two advancing and retiring tenon heads the clamping piece

*m*, the dog *o*, and the fly N, substantially as herein described.

2. The construction of the cutter stocks and arrangement of cutters substantially as herein described, to wit the cutter stock being composed each of an open flange D, attached by a yoke or arms *d*, *d*, to its shaft, with a disk *a'*, bolted to the said flange, and having the cutters *b*, *c*, secured one to its face and the other to its back.

3. The fly N, arranged and operating in any way substantially as described.

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HENRY G. CHAMBERLAIN.

Witnesses:

ASA L. FRENCH,

C. F. RAMSAY.