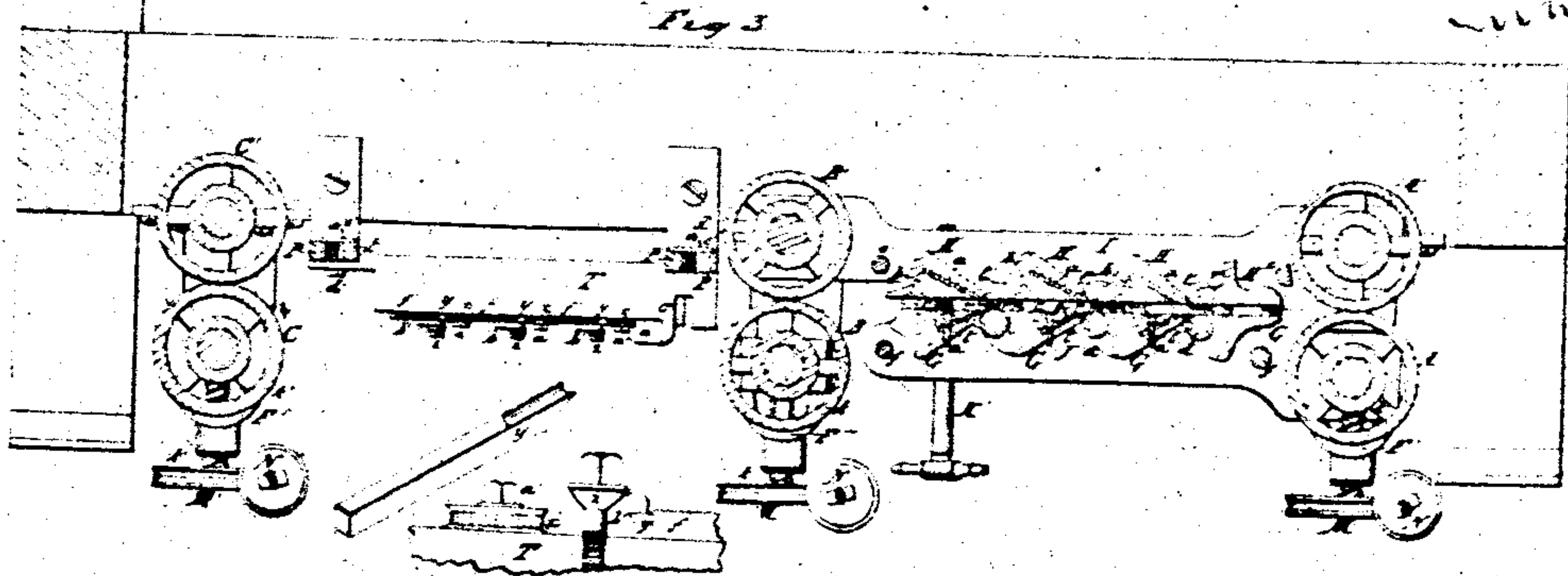
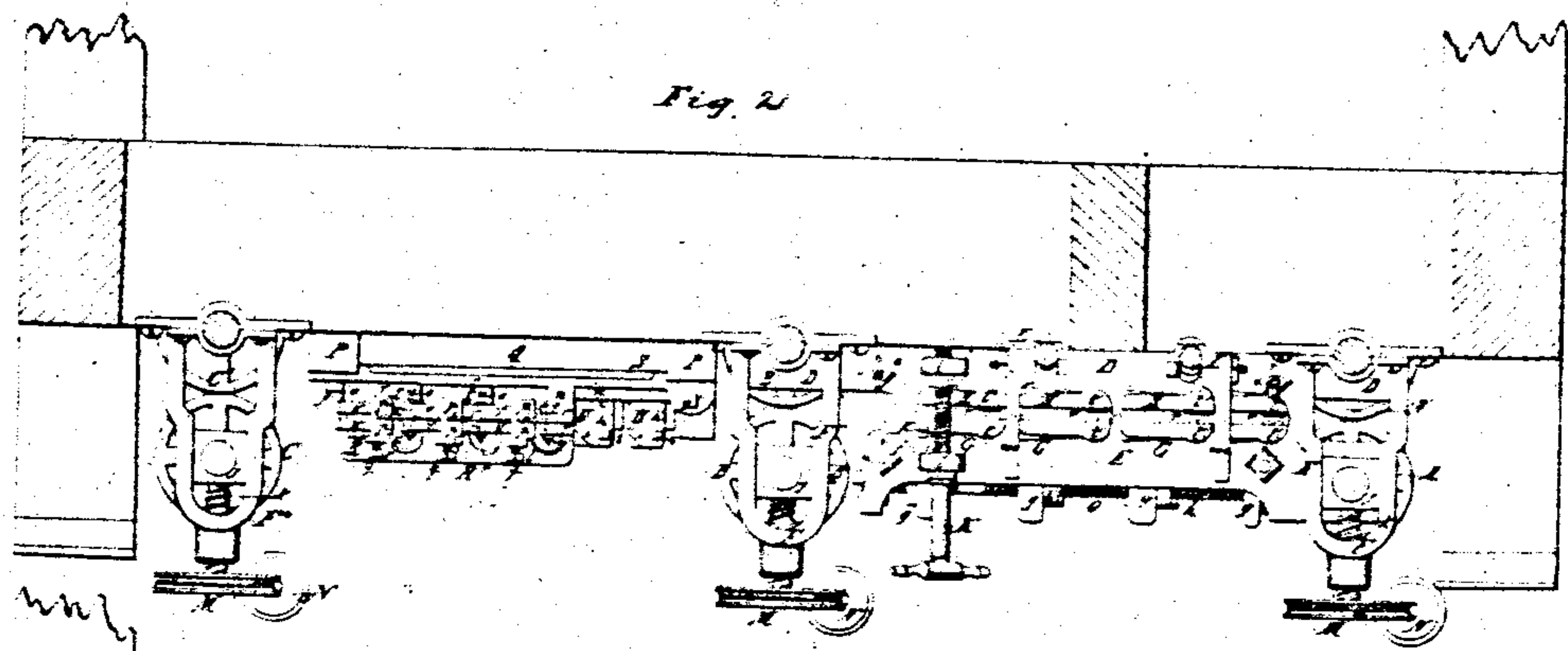
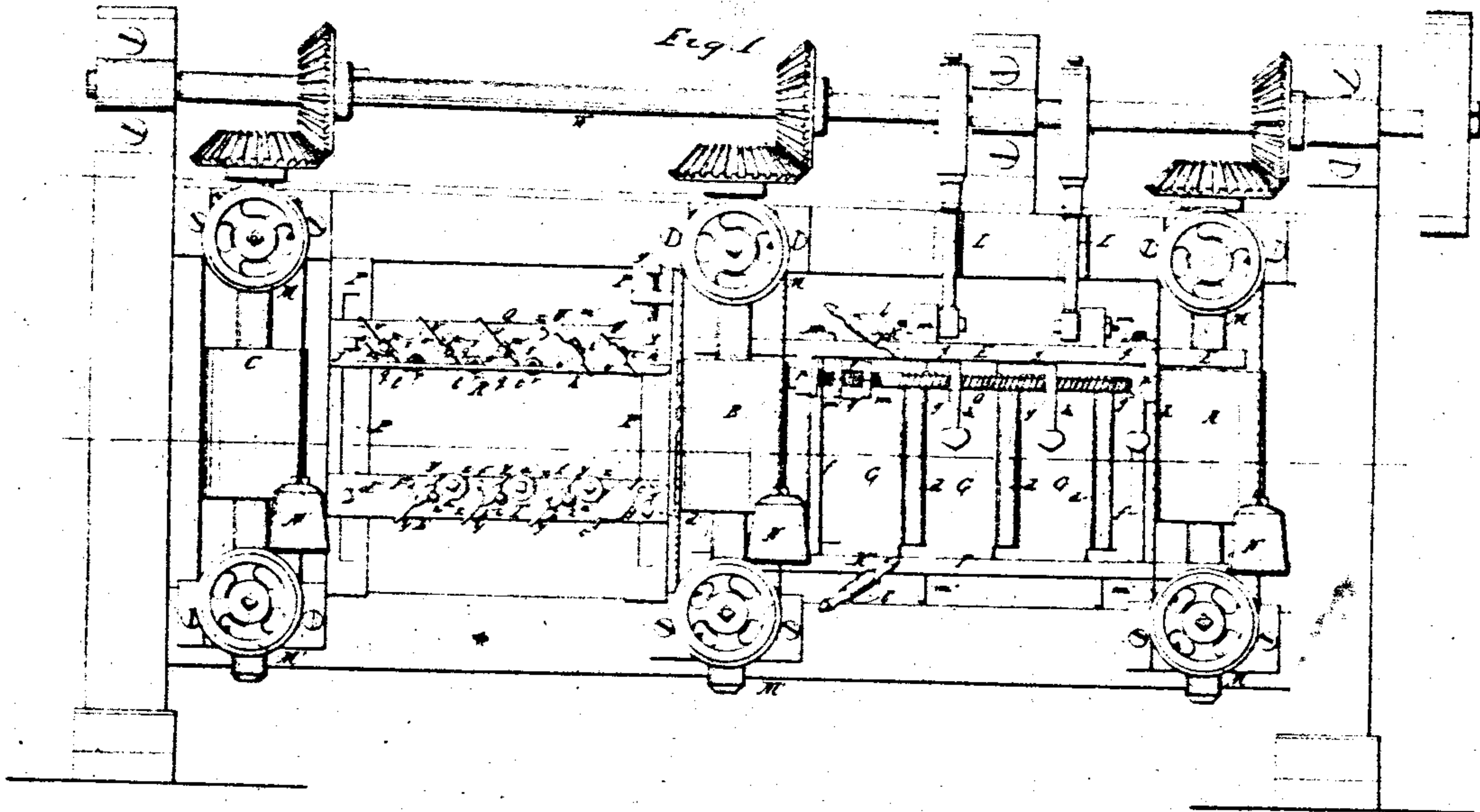


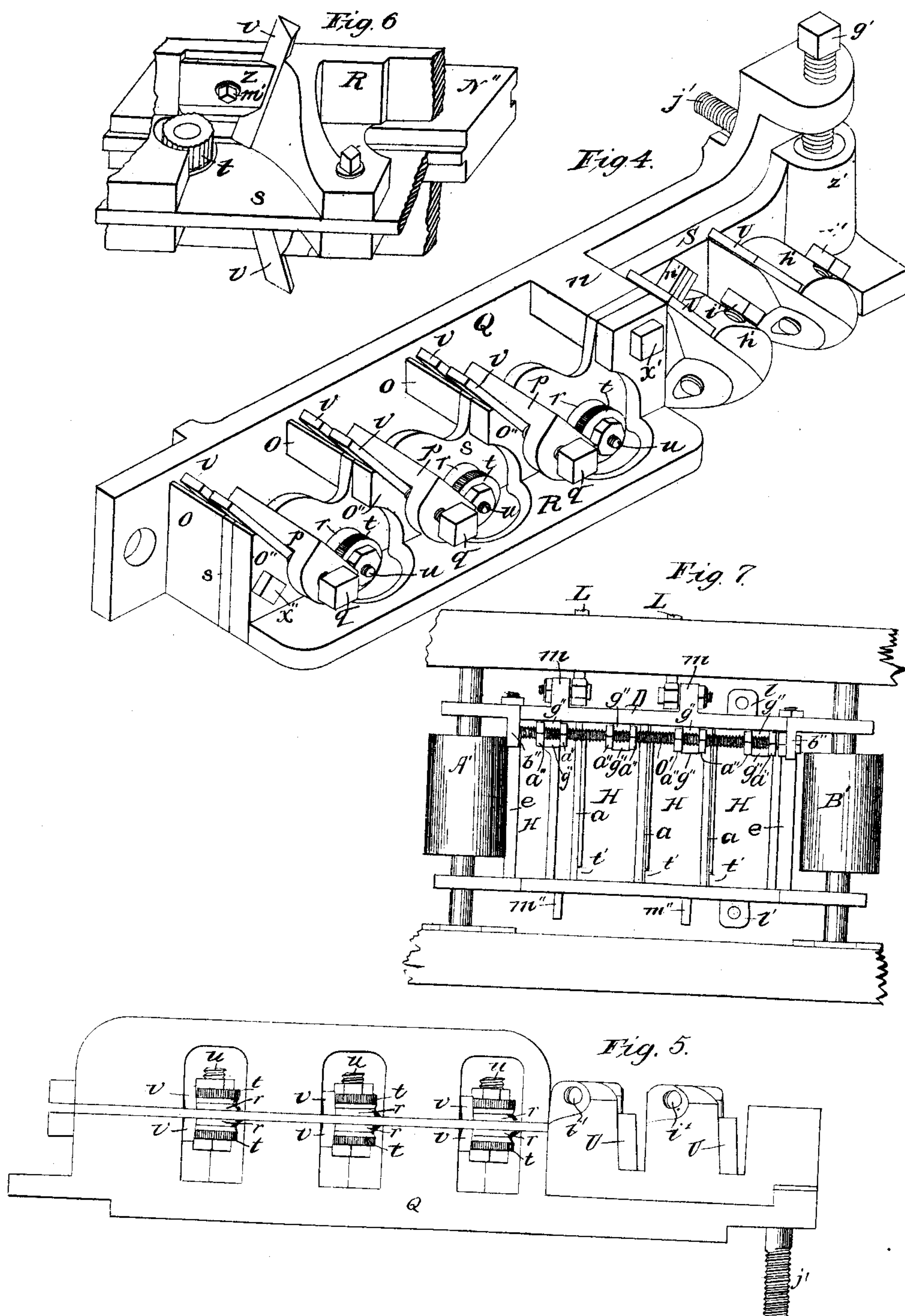
H. Barlow.
Wood Planing Machine.
N^o 8,125.
Patented May 27, 1851.



N. BARLOW.
PLANING MACHINE.

No. 8,125.

Patented May 27, 1851.



UNITED STATES PATENT OFFICE.

NELSON BARLOW, OF ST. LOUIS, MISSOURI.

PLANING-MACHINE.

Specification of Letters Patent No. 8,125, dated May 27, 1851.

To all whom it may concern:

Be it known that I, NELSON BARLOW, of the city and county of St. Louis, in State of Missouri, have invented a new and Improved Machine for Planing, Tonguing, and Grooving Planks, &c.; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making
10 a part of this specification.

Figure 1, is an elevation of the side of the machine; Fig. 2, a horizontal section and top view in the line 1, 1, of Fig. 1; Fig. 3, a horizontal section on the line 2, 2, of Fig. 1, as seen from above; Fig. 4, an enlarged perspective view of the tonguing apparatus detached from the machine; Fig. 5 a view of the under side of the said tonguing apparatus; Fig. 6, a representation of a modified manner of constructing and arranging the tonguing cutters; and Fig. 7, an elevation of a portion of the rear side of the machine.

Similar letters refer to corresponding
25 parts in all the figures.

The frame work for supporting the operating parts of my improved planing, tonguing, and grooving machine may be constructed in any well known or usual manner. A A'—B B'—and C C', are the feeding rollers for conducting planks or boards into the machine, and retaining them while they are being operated upon. The arbors of the rollers A', B', C', revolve in permanent boxes made fast to the frame work of the machine. The arbors of the rollers A' B' pass through holes near the ends of the plate D, which is located a short distance above the upper ends of the said
40 rollers, and through holes near the ends of the plate I, corresponding in shape with the plate D, and placed a short distance below the lower ends of the said rollers. The said plates D, and I are united to each other by the bolt rods e, e, and form a frame for the reception of the plane stocks H, H,—which are placed between them, and arranged as shown in Figs. 2, 3, and 7, and hereinafter set forth. Lugs t', t', project from the front
50 corners of the plane stocks, the form of the outer surfaces of which are segments of circles; these lugs fit accurately into concavities formed in the inner edges of the plates D, I, and are secured in their positions by the screws r', r', passing through the said lugs into female screws formed in

the edges of the said plates, (D, I.) The mouths of the openings in the lugs t'—t' for the reception of the heads of the screws r', r', are reamed out into the form of segments of spheres, to suit a corresponding shape of the heads of the said screws; for the purpose of allowing the said lugs t' t' to turn in their beds, as may be found necessary for the proper adjustment of the plane stocks. The planing knives a, a, may be secured either to the inner or the outer surface of the plane stocks, in any usual or proper manner; but in such positions that their cutting edges will be at the center of vibration of the plane stocks on their bearings; so that the plane stocks can be vibrated without varying the distance of the edges of the knives from the plank. The after angle of each plane stock (H) forms the mouth piece of the planing knife that follows it; and the thickness of shaving to be cut by each knife, is therefore regulated by the position of the after angle of the plane stock that immediately precedes it. The planing knives in the series of stocks H, H, are intended to have a definite cut upon a plank, to merely remove enough to give it a smooth surface; they are therefore adjusted in the following manner. A regulating screw O', passes transversely across the rear sides of the plane stocks (H, H,) and is supported in lugs b'' b'' descending from the upper plate D; pairs of lugs g'' g'' above and below the screw O'; nuts a'' a'' project from the backs of the plane stocks, are placed on the screw O' on each side of the said pairs of lugs g'' g''; which nuts, by their action on the said lugs, will, when the said screw (O') is turned, move the after portions of the plane stocks out or in, and thus cause the planing knives to remove a thick or a thin shaving. It will consequently be perceived, that when the planing knives are arranged to cut a thick shaving, they will stand at a more obtuse angle to the surface of the plank than when they are arranged to cut a thin shaving. The arbors of the rollers A', B', C' have bevel pinions on their upper ends which work into pinions on the driving shaft W.

The plane stocks G, G, which are secured in the frame composed of the plates E, J, and the rods f, f, are arranged in such a manner that they will so adjust themselves as to cause their knives to reduce the planks that pass through the machine all to a uni-

form thickness. The plates E, J, are placed opposite the aforesaid plates D, I, and are embraced between the arms m, m , projecting from the plate D, and the arms $m'' m''$ projecting from the plate I. At the forward ends of the plates E, J, are holes that receive the arbor of the roller A, and the rear ends of the said plates are connected to the plates D, I, by means of the set screws K K'; the former of which passes through the lugs l, l , rising from the top plates D, E, and the latter passes through the lugs l' descending from the bottom plates I, J. The set screws K, K' form fulcrums for the frame E, J, f, f , to vibrate upon, in consequence of the play of the said screws in the enlarged holes in the lugs l, l' , that project from the plates E, J, and they also serve to regulate the distance of the rear end of the same from the plane stock frame D, I, e, e , and thus to govern the thickness that the planks operated upon are to be reduced to.

The journals of the arbors of the rollers A, B, C, work in movable boxes j, j, j , located respectively in the pairs of supporters F F'—F'' F'''—F⁴ F⁵—which boxes are pressed inward by means of the several pairs of screws k, k' , which pass through openings in the outer extremities of the said box supporters, and have pulleys M, M', upon their outer ends that are respectively connected to each other by means of bands that support the several weights N, N, N; which weights and bands preserve the arbors of the rollers in vertical positions, and press the rollers uniformly against the planks during their passage through the machine; and the roller A, regulates the position of the plane stock frame E, J, so that the knives in the plane stocks G, G, will cut the requisite thickness of shaving to bring the planks operated upon all to the required thickness. The threads of the screws k, k' pass around them at angle of about thirty degrees to the axes of the same, which inclination of the screw threads, will allow the screws to be turned by pressure against their extremities, and thereby give them an elastic pressure upon the boxes that the arbors of the feeding and retaining rollers work in, which will enable them to give back whenever it may be necessary to prevent breakage, and also to receive planks of different thicknesses. The plane stocks G, G, are secured to the plates E, J, by means of the lugs $t' t'$ and screws $r' r'$ in the same manner that the plane stocks H, H, are secured to the plates D, I, as before described; and the knives a, a , may be secured to the said plane stocks in any well known or proper manner, but in such positions that the cutting edges of the knives will be at the center of the vibratory motion of the said plane stocks. Lugs (Fig. 3) project from the rear sides of the extremities of the plane stocks G, G, which receive the

journals of the rollers d, d ; each of which rollers is located a short distance in front of the cutting edge of the knife in the stock next in succession, and forms the front side of the mouth of the same for the discharge of its shavings. The rollers d, d , have to be pressed back before the planing knives, immediately in their rear, can operate upon a plank; the plane stocks G, G, are made self adjusting in their positions, so as to adapt the cut of their knives to the varying thicknesses of planks to be operated upon, in the following manner: viz: A screw O, whose thread is at an angle of about thirty degrees with its axis, passes transversely across the front of the said plane stocks (G, G,) and is suspended in the lugs $p' p'$ descending from the plate E; pairs of lugs g, g , project from each of the said plane stocks (G, G,) passing above and below the said screw O; weighted levers h, h , having female screw openings in their inner ends, are placed upon the screw O, in such positions as to bar against the lugs g, g , and by the weights at their outer extremities, force the faces of the series of plane stocks G, G, all into a line with each other when they are in repose; as shown in Figs. 2 and 3. When a plank or board enters the machine, between the rollers A and A' it presses against the foremost roller d , and pushes it back against the elastic pressure of its weighted lever h , to allow the foremost planing knife to take hold of its definite and distinct portion of the wood to be removed; and so on through the whole series of planing knives. A greater amount of play is allowed to the foremost roller (d) than to those that follow after it; for the purpose of allowing the foremost planing knife to remove a shaving of sufficient thickness to pass under and take off all the gritty matter that may be upon the plank. The extent of vibratory movement that can be imparted to the plane stocks G, G, is regulated by the depth of the recesses in the plates E, J, that receive the ends of the said plane stocks—shown in Fig. 2. The free action of the plates E, J, upon the fulcrums at their rear ends, combined with the elastic pressure exerted upon their forward ends by the foremost pair of screws k, k' , and their actuating weight N, serves to distribute the amount to be removed from this side of the plank, equally amongst all the knives in the plane stocks G, G,—save the foremost knife, as above referred to.

On the opposite side of the plank, the fixed cutters in the stocks H, H, will—at the same time that the knives in the stocks G, G, are operating—remove just enough from the plank to produce a perfectly smooth surface. By unscrewing the set screws K K' the rear end of the plane stock frame E, J, can be swung outwards upon the arbor of the roller A, so as to give free access to the

inner sides of the plane stocks in both frames. Before adjusting the series of planing knives a, a , to their proper positions in the plane stocks, the inner surfaces of the said stocks should all be brought into a line with each other in their respective frames; and then the knives are brought into their proper positions by arranging their cutting edges on the same line with the faces of said plane stocks: The rear edges of the stocks H, H , are then thrown back a sufficient distance to regulate the cut of their knives, and secured by means of the set screw O' , as before described; and the amount of cut of the knives in the stocks G, G , will be self regulated by means of the rollers d, d , acted upon in the manner above set forth. L, L , are pitmen descending from cams on the driving shaft W , to the united plane stock frames, and jointed to the plate D , forming the top of one of the said frames. It will therefore be perceived, that when motion is imparted to the said driving shaft, a reciprocating motion will be imparted to the said plane stock frames, which will cause the planing knives to have a drawing cut across the fiber of the wood, and thereby enable them to do smoother work and with less power than can be accomplished with stationary cutters which act by dead resistance.

Instead of connecting the two plane stock frames with each other, in the manner before described, an independent reciprocating movement may be imparted to each frame; which movements of the respective frames may alternate with each other. Or in place of one of the said plane stock frames, a bed plate or rollers may be employed.

After planing a plank during its passage between the two pairs of rollers $A A'$ and $B B'$ as above set forth, it passes to the tonguing and grooving apparatus located between the pairs of rollers $B B'$ and $C C'$. The tonguing cutters are secured to the stock Q, R, S , and the grooving cutters in the stock T ; which stocks are confined to the supporters P, P , in such a manner that they can be adjusted to any desired position by means of retaining screws, passing through the said stocks and through grooves in the supporters. The stock Q , being held by the screws j , on which are nuts at the rear side of the supporters; and the stock T , is held by the screws $d' d'$ and the nuts $e' e'$ as shown in Figs. 1, 2 and 3. At the forward end of the plate Q , of the stock Q, R, S , there are placed the reducing knives $U U$ in an auxiliary adjustable stock S ; which auxiliary stock is connected to the plate Q , by the fulcrum bolt n' , on which it vibrates. A screw g' passed down through a lip that projects from the front end of the plate Q , into a tube z' on the front end of the auxiliary stock S , in which is located spring for

the said screw to bear upon; which enables the knives in the said stock to adapt themselves to boards of different widths. From the face of the plate Q , spring the projections o, o : the extremities of which are jointed to an accurate line with each other; and their front surfaces and all brought to the same angles of inclination—say about forty-five degrees. The plate R , forming a part of the stock Q, R, S , has projections $o'' o''$ springing from it, which correspond in shape with the projections o, o ,—save in their being of less width. A plate s , accurately jointed and smoothed on both sides, and brought to exactly the thickness of the tongue to be formed on boards or planks, is placed between the projections o & o'' of the plates Q , and R , and the three plates are firmly united to each other by the screws x', x'' . Fluted rollers t, t , which have cutting edges r, r , radiating from their inner ends, are placed opposite each other against the plate s , and are secured to each other and to the plate (s .) by the screws u, u , and the nuts upon the same: the inner sides of the cutting edges r, r , bearing closely against the plate s , and their peripheries projecting below the edge of the said plate a suitable distance for cutting the sides of the tongue to be formed upon a plank. The knives v, v , are placed on opposite sides of the center plate s , against the front inclined surfaces of the projections o, o'' , and they are held securely in their places by means of the gibs p, p , and the set screws q, q ; which act as follows, viz: the said gibs ($p p$) pass into flaring slits in the center plate s ; and consequently as they are driven down into these slits, their rear surfaces are made to press the cutters against the front sides of the projections o, o' . The gibs p, p , have lips at their ends of corresponding shape, and when the set screws q, q , which pass through the lips at the front ends of the said gibs, are so turned as to cause their inner ends to bear against the outer edges of the knives v, v , on the front side of the center plate s , they press the inner edges of the said knives firmly against the center plate, and by the same movement, cause the lips at the rear ends of the gibs to draw upon the knives v, v , on the rear side of the center plate, (s .) and force their inner edges firmly against the said plate.

It will therefore be perceived that the center plate s , serves as an unerring guide to the proper positions of the rotating and stationary knives and the fluted rollers, which act conjointly with each other in forming a tongue upon the edge of a plank. The reducing edging cutters U, U , prepare the edge of a plank for the action of the tonguing cutters; when the edge of a plank comes in contact with the sharp edges r, r , and the fluted rollers t, t , they are made to

rotate, as the sharp edges cut into the edges of the plank on each side of the center plate *s*, and the fluted rollers bear upon the plank just in front of the stationary knives *v*, *v*, which remove the wood between the incisions made by the said rotating sharp edges *r*, *r*, and the outer angles of the edge of the plank. The said fluted—or spur—rollers serving to break the fiber just in front of the edges of the said stationary knives and prevent them from tearing splinters therefrom, in case the wood should be cross grained, and also serving as rotating mouth pieces to the said knives. The grooving apparatus which is combined with the stock *T*, is arranged and operates as follows, viz: the knife *C'*—the cutting edge of which projects above the upper side of the stock *T*—smooths the edge of a plank preparatory to its being operated upon by the grooving apparatus which is secured to the front surface of the said stock. The front surface of the said stock *T*, is brought to a perfectly straight and even surface; the grooving apparatus, composed of the several fluted rollers *x*, *x*, having cutting edges radiating from their ends, and the stationary cutters *y*, *y*, are then secured to the said smooth surface of the stock, in the manner shown in Figs. 1 and 3: viz: each fluted roller is secured by a screw *a'*—the shank of which forms the journal for the roller to rotate upon; each stationary knife *y*, is secured by means of a triangular piece *f'*—(which is bolted to the face of the stock)—in conjunction with the angular gib *b'* and the conical beaded screw *z*; the rear side of the knife bearing against the front edge of *f'* and the gib *b'* being pressed against the front side and the outer edge of the said knife (*y*) by the conical headed screw *z*, forces the inner edge of the knife firmly against the face of the stock, and its rear side firmly against the front edge of the projection *f'*. The cutting edges at the inner ends of the fluted rollers *x*, *x*, bear closely against the front side of the stock *T*; and the peripheries of the said rollers and the cutting edges at their ends, as also the cutting edges of the stationary knives *y*, *y*, project a sufficient distance above the upper edge of the stock, to enable them to form the requisite depth of groove in a plank. When the edge of a plank comes in contact with the fluted rollers *x*, *x*, and the radiating cutting edges at their extremities, it imparts a rotary motion to them while they are acting upon the same; viz: The said rotating cutting edges making incisions into the edge of the plank, and thereby forming the sides of the groove perfectly clean and smooth and the fluted rollers bearing upon the edge of the plank, immediately in front of the edges of the stationary cutters *y*, *y*, serving as rotating mouth pieces thereto and also serving to break the fibers of the wood

between the incisions made by the rotating cutters, preparatory to the removal of the same by the said stationary cutters.

To enable the stationary cutters *y*, *y*, to make more perfect angles at the bottoms of the grooves, and to discharge their shavings more freely, I make their faces and cutting edges slightly concave as shown in Fig. 4. It will be perceived that the face of the stock *T*, serves as an unerring guide to the proper adjustment of the grooving apparatus.

Suitable guides, or fences, for keeping the planks in proper position while being operated upon by the tonguing and grooving apparatus, must be provided; but it has not been deemed necessary to represent it, for the reason that the proper construction and arrangement of such guides or fences, will be perfectly obvious to all machinists.

Fig. 6, represents a different shape and arrangement of the stationary tonguing knives *v*, *v*; in this arrangement, the cutting knives are of a triangular shape, and rest upon the plate *R*, with their ends bearing against the center plate *s*; and they are secured in their positions by the gibs *Z*, and set screws *m'*. The acute angle at the junction of two of the sides of each of these knives forms their cutting edges, and they may be arranged at right angles with the center plate *s*, or at any other angle that may be preferred. This plan of arranging the stationary tonguing cutting knives, renders them less liable to clog with green lumber, than any other known method. *N''* is the plank, showing its relative position to the cutters; the center plate *s*, both in this and the former plan, bears upon the end of the tongue, and forms a guide for its width and depth through the whole series of cutters.

The plane stocks *G*, *G*, and *H*, *H*, may be so arranged as to pass obliquely across the face of the planks operated upon if deemed preferable.

Having thus fully described my improved machine for planing, tonguing and grooving planks, &c., what I claim therein as my invention and desire to secure by Letters Patent, is—

1. The jointing or hinging of the plane stock supporting frame *E*, *J*, *f*, *f*,—or its equivalent—at one end, and giving it an elastic bearing at its opposite end, substantially as herein set forth: whether the said plane stock supporting frame be used in connection with individually vibrating plane stocks, or with other descriptions of plane stocks, or planing knives or cutters, for the purpose of reducing or planing planks or boards upon their sides or edges.

2. I claim the combination of the supporting frame containing the adjustable plane stocks *H*, *H*, with the self adjusting supporting frame containing the plane

stocks G, G, by which the inner or under surfaces of the plane stocks G, G, are made to form a self adjusting bed on one side of a plank, while the knives in the stocks H, H, are operating upon and facing the opposite side of the same; and by which the inner or under surfaces of the plane stocks H, H, are made to form an unyielding bed on one side of a plank, while the knives in the plane stocks G, G, are operating upon and reducing its opposite side; and by which, a plank can be faced on one side, and reduced and faced upon its opposite side at simultaneous operations, substantially as herein set forth.

3. I claim the combination of the supporting frame containing the self adjusting plane stocks G, G, with the arbor of the roller A, at its forward end, and with the supporting frame containing the plane stocks H, H, at its rear end, for the purpose, in the first place, of so guiding the transversely reciprocating movements of the said plane stock supporting frames, to keep the inner sides of the respective series of plane stocks contained therein, parallel with each other, and parallel with the surfaces of the pairs of rollers A, A', and B, B'; and in the second place, for the purpose of enabling the supporting frame containing the self adjusting plane stocks G, G, to be detached from the supporting frame containing the adjustable plane stocks H, H, and be swung outward upon the shaft of the roller A, to afford free access to the inner sides of the plane stocks in both the said plane stock supporting frames, substantially as herein set forth.

4. I claim the combination of the rollers d, d, with the plane stocks G, G, when they are so arranged that the roller in one plane stock will form a rotating and self adjusting mouth piece to the planing knife that succeeds it, and at the same time form a

bed on one side of a plank for a planing knife acting upon its opposite side, substantially as herein set forth.

5. I claim the giving to straight edged planing or reducing knives or cutters, that are arranged athwart the surfaces of the boards or planks operated upon, a transversely reciprocating movement, while a continuous longitudinal movement is imparted to the said boards or planks.

6. I claim the manner of producing a uniform elastic pressure upon the upper and lower bearing boxes of the arbors of the pressure rollers A, B, C, viz, by means of pairs of screws k, k', arranged as herein described, and having threads inclining at angles of about thirty degrees with their axes, which are banded together and operated upon by a weight (N,) substantially as herein set forth.

7. I claim the within described improved stock that receives the tonguing cutters v, v, and r, r, composed of the central governing plate s, combined with the projections o, o, on the side plate Q, and the projections o'', o'', on the side plate R, substantially as herein set forth.

8. I also claim the manner of combining the stationary cutters v, v, with the governing center plate s, by means of the inclined projections o, o'', on the sides of the said plate, the flaring notches in the plate, and the gibs p, p, having lugs at each extremity, placed in the said flaring notches and acting upon the edges and front sides of the said cutters v, v, substantially as herein set forth.

The above specification of my improved machine for planing, tonguing and grooving plank, signed this 18th day of Decr 1850.

NELSON BARLOW.

Witnesses:

Z. C. ROBBINS,
R. G. CUNSON.