No. 710,985. Patented Oct. 14, 1902.

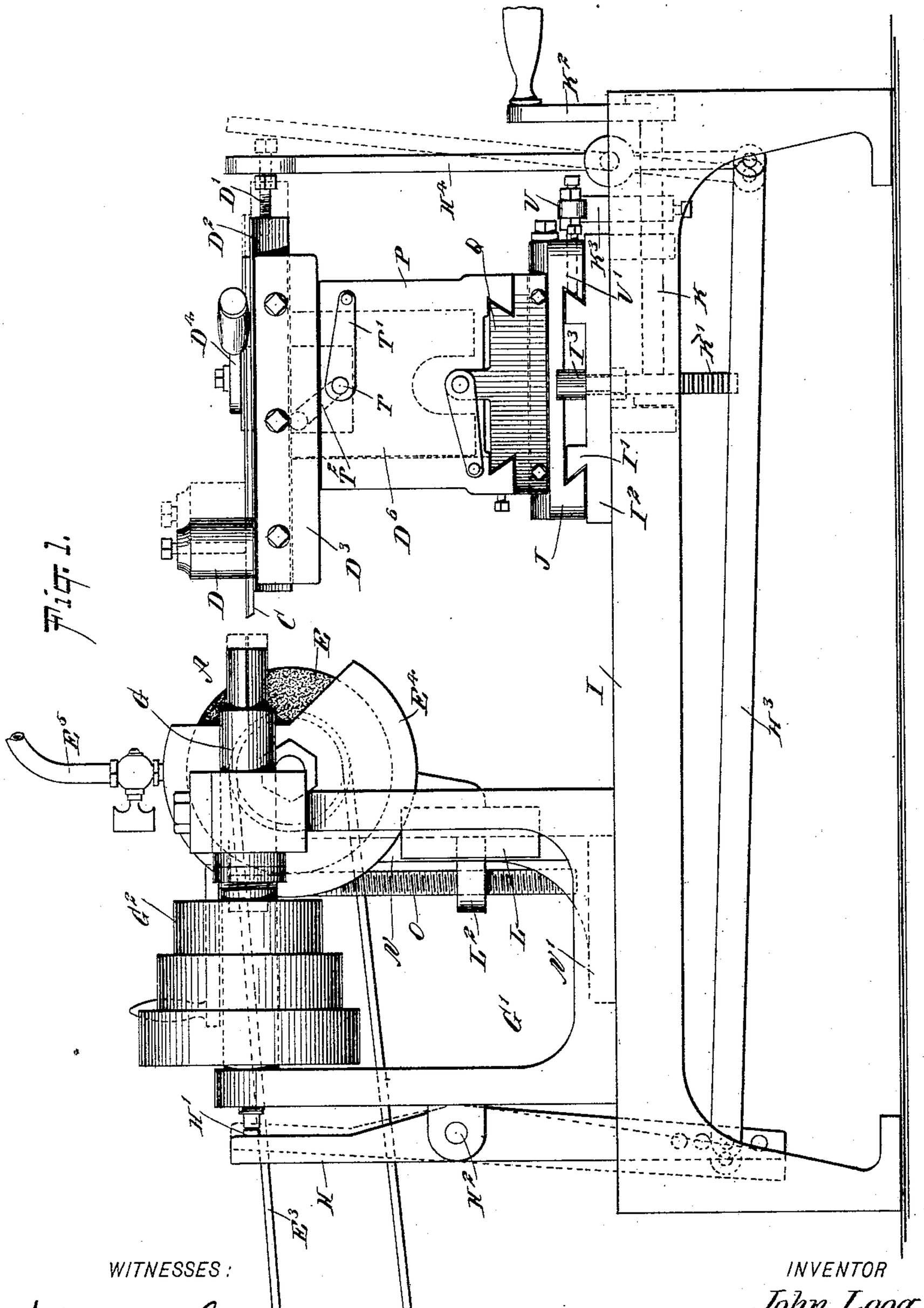
J. LOOG.

PEARL BUTTON TURNING MACHINE.

(Application filed Dec. 3, 1901.)

(No Model.) 4 Sheets—Sheet 1.

Fig. 1.



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No. 710,985. Patented Oct. 14, 1902.

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PEARL BUTTON TURNING MACHINE.

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(No Model.) 4 Sheets—Sheet 2.

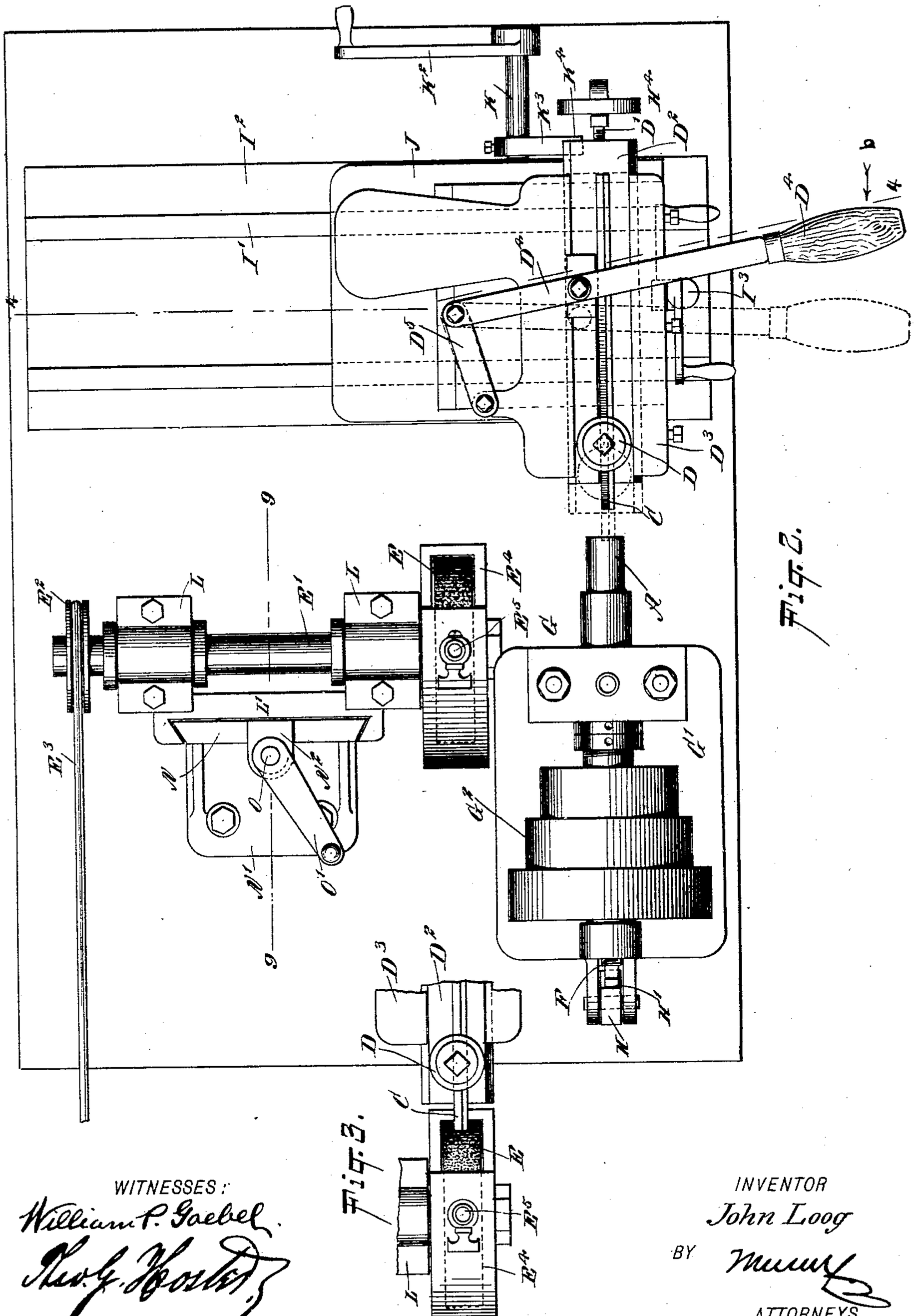

Fig. 2.

Fig. 3.

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(No Model.) 4 Sheets—Sheet 3.

Fig. 4.

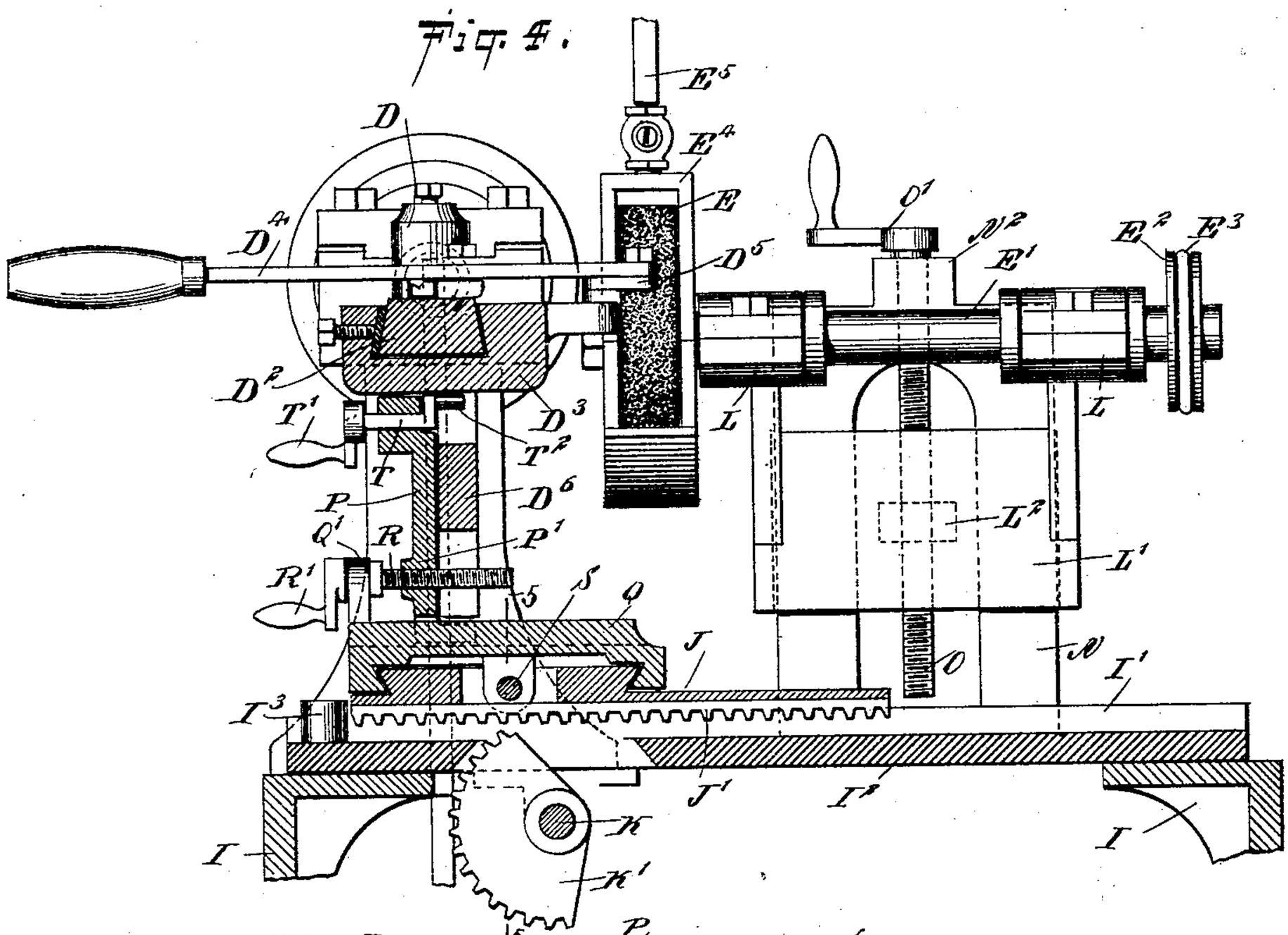


Fig. 5.

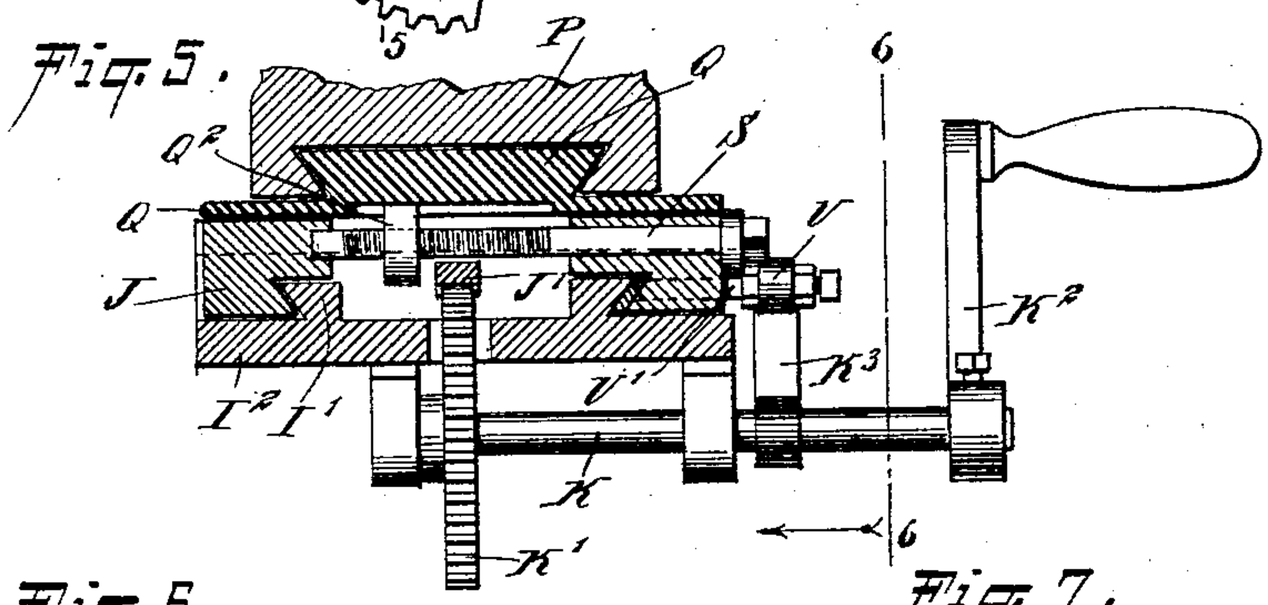


Fig. 6.

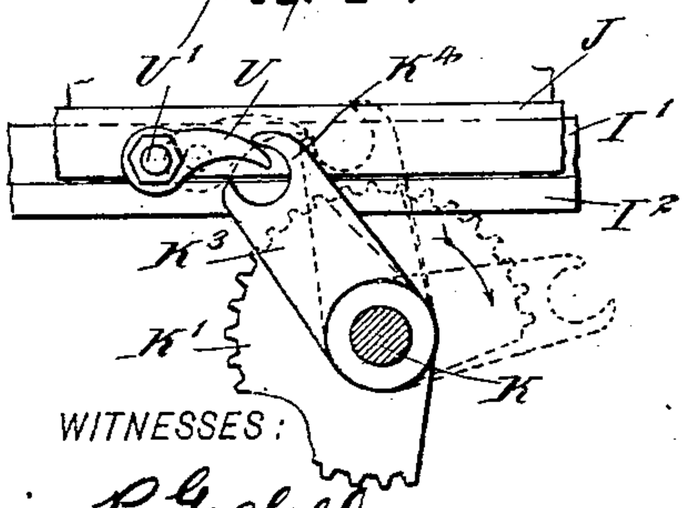
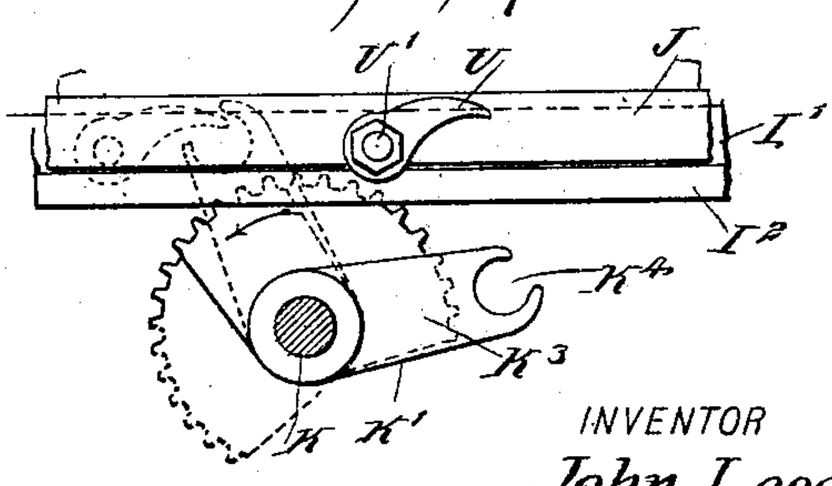


Fig. 7.



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PEARL BUTTON TURNING MACHINE.

(Application filed Dec. 3, 1901.)

(No Model.) 4 Sheets—Sheet 4.

Fig. 8.

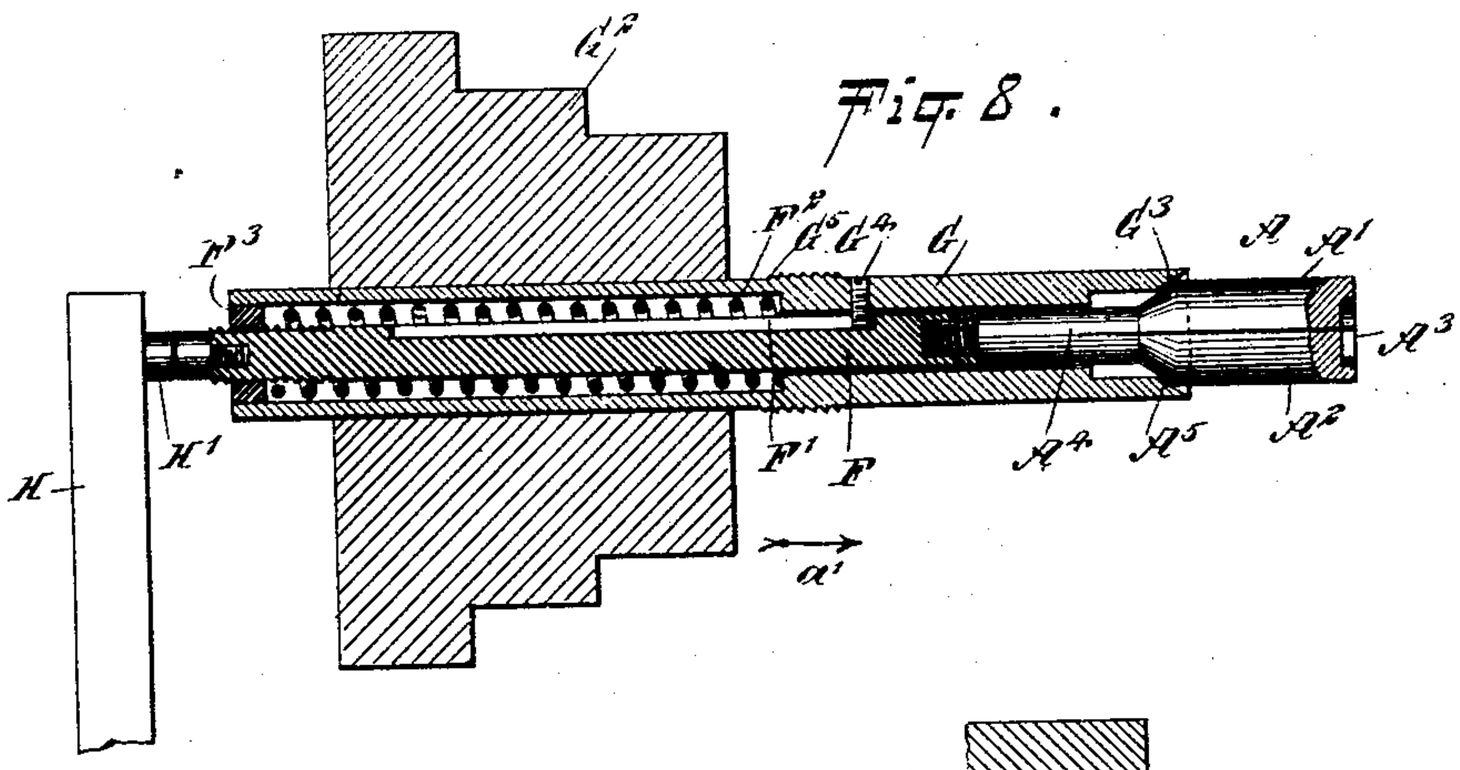


Fig. 9.

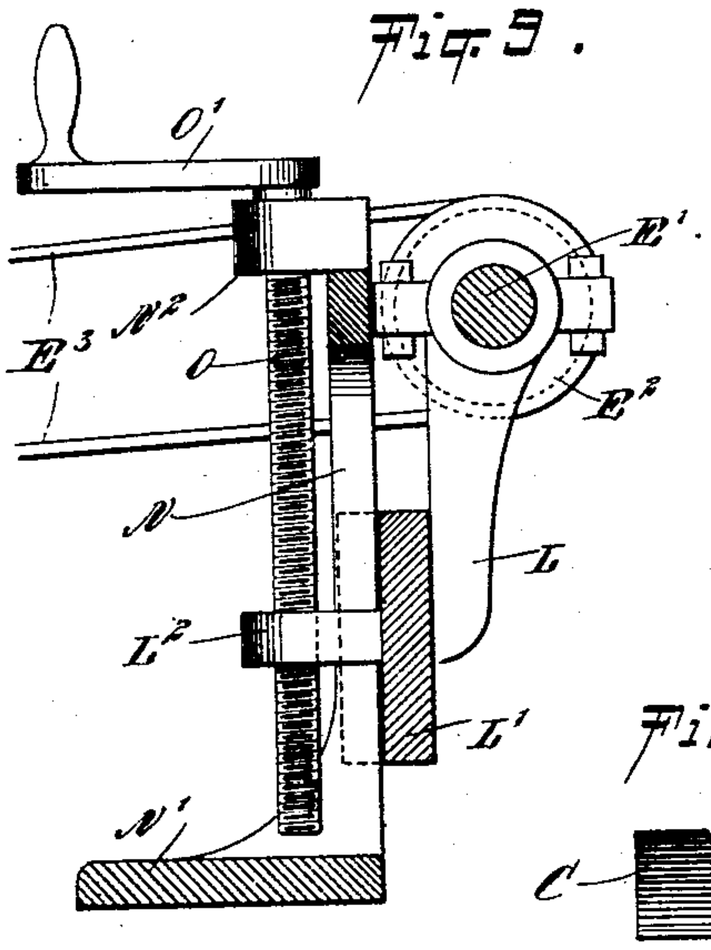


Fig. 10.

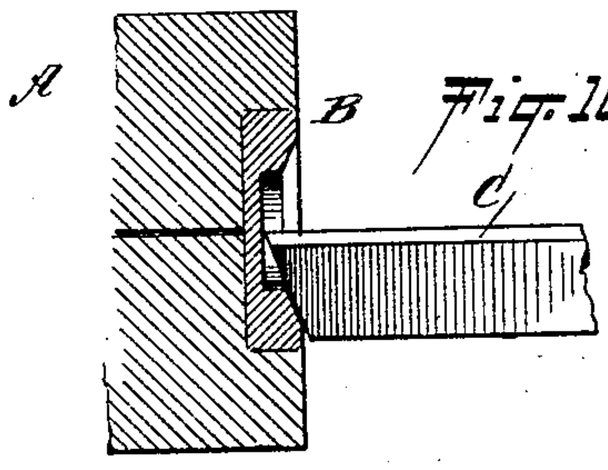


Fig. 11.

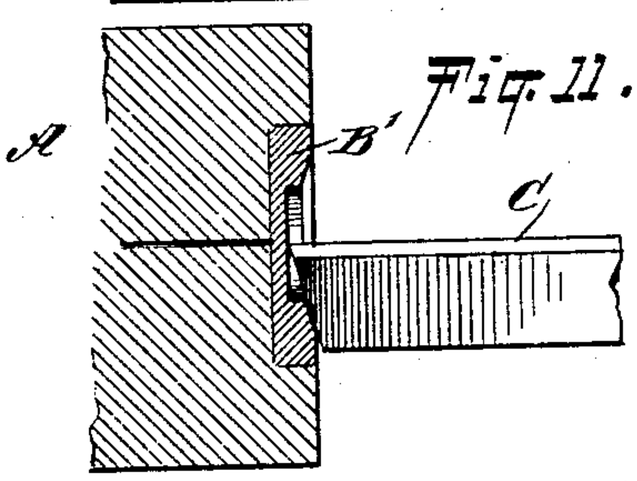


Fig. 12.

Fig. 13.

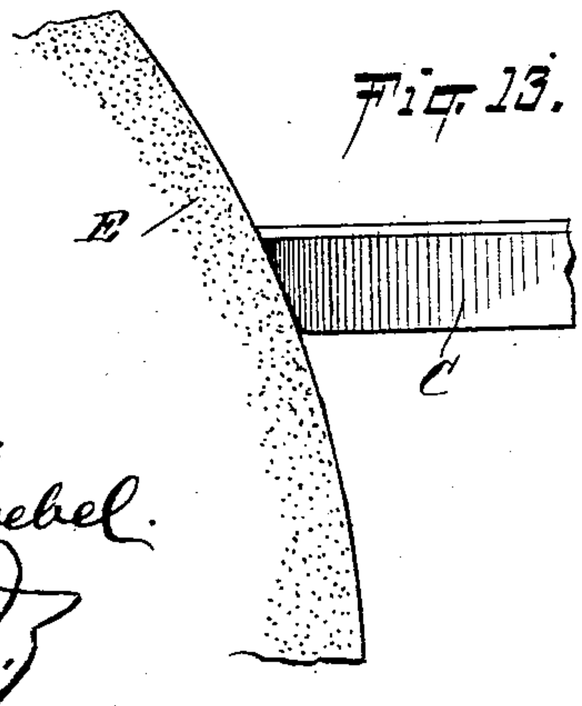
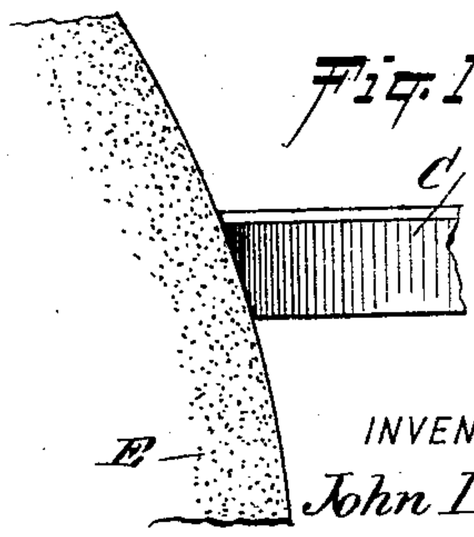


Fig. 14.



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UNITED STATES PATENT OFFICE.

JOHN LOOG, OF BROOKLYN, NEW YORK.

PEARL-BUTTON-TURNING MACHINE.

SPECIFICATION forming part of Letters Patent No. 710,985, dated October 14, 1902.

Application filed December 3, 1901. Serial No. 84,521. (No model.)

To all whom it may concern:

Be it known that I, JOHN LOOG, a citizen of the United States, and a resident of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Pearl-Button-Turning Machine, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved pearl-button-turning machine arranged to permit of turning the face of a button the desired depth according to the thickness of the stock to be treated and without removing the tool from the tool-rest.

The invention consists of novel features and parts and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

A practical embodiment of my invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of the improvement. Fig. 2 is a plan view of the same. Fig. 3 is a like view of part of the same, showing the tool in contact with the grinding-wheel. Fig. 4 is a transverse section of the improvement on the line 4 4 in Fig. 2. Fig. 5 is a longitudinal section of the tool-post shifting and locking mechanism, the section being on the line 5 5 in Fig. 4. Fig. 6 is a cross-section of part of the improvement on the line 6 6 in Fig. 5, showing the locking device for the tool-post. Fig. 7 is a like view of the same with parts in a different position. Fig. 8 is an enlarged longitudinal sectional elevation of the chuck for holding the stock. Fig. 9 is a sectional side elevation of the means for raising and lowering the grinding-wheel, the section being on the line 9 9 in Fig. 2. Fig. 10 is an enlarged sectional side elevation of the chuck, the stock, and the turning-tool in position on the stock. Fig. 11 is a like view of the same with the tool shaped for turning thinner stock to a less depth. Fig. 12 is an end view of the tool. Fig. 13 is an enlarged side elevation of the grinding-wheel and tool applied thereon, and Fig. 14 is a like view of the same with the grinding-wheel in a different position relative to the tool.

The improved turning-machine is provided with a chuck A for holding the stock B to be turned on its face by a tool C, carried in a tool-post D and adapted to be ground to the desired shape, according to the thickness of the stock under treatment on the grinding-wheel E, located somewhat at the rear of the chuck A, as is plainly illustrated in Figs. 2 and 3. The tool-post D is mounted to slide longitudinally to bring the cutting edge of the tool C in and out of contact with the stock B for turning the face thereof, while the chuck and the stock revolve together. The tool C stands in axial alinement with the chuck during the turning operation, and the bevel for forming the cutting edge of the tool is shaped according to the depth to which the button is to be turned and which depth depends upon the thickness of the stock. The stock is placed in a position on the chuck at the time the tool is in an outer position, the jaws A' A^2 of the chuck then being open, and when the tool is moved forward the jaws automatically close to securely hold the stock in place and cause it to revolve during the turning operation. The opening and closing of the chuck-jaws is controlled by a tool-post, presently to be described in detail.

The jaws A' and A^2 of the chuck are formed at their forward end with an annular recess A^3 for receiving the stock B, as indicated in Figs. 10 and 11, and said jaws A' A^2 are formed of a single piece of steel split longitudinally and formed with a shank A^4, as is plainly shown in Fig. 8. The shank A^4 screws into a rod F, mounted to slide longitudinally in a spindle journaled in the headstock G' and provided with a conical pulley G^2, connected by belt with other machinery for imparting a revolving motion to the spindle G.

The forward end of the spindle G is formed with an annular bevel G^3, adapted to engage an annular bevel A^5, formed on the jaws A' A^2, so that when the chuck A is moved into an innermost position the bevel G^3 in engaging the bevel A^5 causes the jaws A' A^2 to close and hold the stock B in place in the recess A^3, and when the chuck A is moved longitudinally in an outer direction, so that the bevel A^5 moves out of engagement with the bevel G^3, then the jaws A' A^2 automatically open by their own resiliency to release the

stock and allow of inserting new stock into the recess A^3. The rod F turns with the spindle G and is free to slide longitudinally therein, and for this purpose the said rod is provided with a longitudinal groove F′, into which extends a set-screw G^4, carried by the spindle G. A spring F^2 is coiled on the rod F within the spindle G and abuts at one end against the shoulder G^5 of the spindle G, and at the other end the spring rests against a collar F^3, screwed or otherwise secured to the rod F. The spring F^2 serves to hold the chuck A normally in an innermost position—that is, with the bevel A^5 in contact with the bevel G^3 to close the jaws A′ A^2 for holding the stock in place, as above described.

The rod F is moved with the chuck A outward in the direction of the arrow *a′* to allow the jaws to open, and for this purpose the outer end of said rod is engaged by the lug H′ of a lever H, fulcrumed at H^2 on the headstock G′ (see Fig. 1) and connected at its lower end by a link H^3 with a lever H^4, fulcrumed on the bed I of the machine, said lever being adapted to be engaged at its upper end by a screw D′, screwing in the outer end of a slide D^2, carrying the tool-post D. The slide D^2 is mounted to slide longitudinally in a bearing D^3, and said slide is pivotally connected with a hand-lever D^4 under the control of the operator and fulcrumed on a link D^5, pivoted to the bearing D^3. (See Figs. 1 and 2.)

By moving the lever D^4 in the direction of the arrow *b′* (see Fig. 2) the tool C is moved with its cutting edge into engagement with the stock to turn the same; but when the lever is moved in the inverse direction of the arrow *b′* to move the tool away from the stock then the screw D′ moves in engagement with the lever H^4 and swings the same into the position shown in dotted lines in Fig. 1, thereby causing a swinging of the lever H by the action of the link H^3, said lever H imparting a forward sliding motion to the rod F and the chuck A to open the jaws for the turned stock to drop out of the recess or seat A^3. New stock is now placed in position in the jaws and the operator moves the lever D^4 forward in the direction of the arrow *b′*, and in doing so the screw D′ releases the lever H^4, together with the link H^3, and the lever H is returned to its forward position by the return movement of the rod F, caused by the action of the spring F^2. When this takes place, the jaws A′ A^2 are again closed to securely hold the stock, which is now acted upon by the cutting edge of the tool C, brought in contact with the face of the stock.

When turning stock of different thicknesses, (see Figs. 1 and 11,) it is necessary to change the bevel of the tool C, as stock of considerable thickness is turned deeper than that of a less thickness, and in order to quickly change the bevel of the tool for turning different-sized stock accurately and without removing the tool from the tool-post D, I support said tool-post on a transversely-slidable carriage J to bring the tool in alinement with the grinding-wheel D and then shift the tool-post D by manipulating the lever D^4 so as to bring the cutting edge of the tool in grinding contact with the grinding-wheel. The latter is journaled in bearings adapted to be raised or lowered to give a different bevel to the cutting edge of the tool, as will be readily understood by reference to Figs. 13 and 14.

The detail construction is as follows:

The carriage J is mounted to slide on transverse guideways I′, formed in the top of the plate I^2, carried by the bed-plate I, and on the under side of the said carriage is formed or secured a transversely-extending rack J′ in mesh with a segmental gear-wheel K′, fastened on a shaft K, extending transversely and journaled in suitable bearings carried by the plate I^2. A handle K^2 is arranged on the outer end of the shaft K and is under the control of the operator to permit the latter to turn the shaft K and cause the gear-wheel K′ to move the rack J′, the carriage J, and the tool-post D, sliding transversely until the cutting-tool C is in longitudinal alinement with the grinding-wheel E. (See Fig. 3.) The handle K^2 is now moved so as to bring the tool C in grinding contact with the periphery of the grinding-wheel E, and as the grinding-wheel and the tool C have a fixed relation for the time being it is evident that the desired bevel is given to the tool C.

The grinding-wheel E is secured on a spindle E′, journaled in suitable bearings L and provided with a pulley E^2, connected by a belt E^3 with other machinery for imparting a rotary motion to the grinding-wheel E. The latter rotates in a casing E^4, open at one side and provided at the top with a water-supply pipe E^5 for supplying the grinding-wheel with water to insure a proper sharpening of the tool.

The bearings L are formed or secured on a vertical slide L′, mounted to move in a guideway N, formed with a bottom flange N′, secured by bolts to the bed-plate I. On the slide L′ is formed or secured a nut L^2, in which a vertically-disposed screw-rod O is mounted to turn in a bearing N^2, arranged on the top of the guideway N, and the extreme upper end of said rod O is provided with a crank-arm O′, adapted to be taken hold of by the operator to turn the screw-rod and cause the slide L′ to move up or down in the guideway N, according to the direction in which the crank-arm O′ is turned.

When it is desired to grind a larger bevel on the tool C, the operator turns the crank-arm O′ so as to raise the slide L′, and with it the bearings L, spindle E′, and grinding-wheel E, to change the relation between the grinding-tool and the wheel, and when it is desired to form a smaller bevel on the tool the crank-arm O′ is turned in the opposite direction to lower the grinding-wheel correspondingly.

The cutting edge of the tool C is shaped according to the form intended to be given to the face of the button. (See Figs. 10, 11, and 12.)

When the desired bevel has been given to the tool, the carriage J is returned to its former position by the operator turning the crank arm or handle K^2 in the opposite direction until the carriage abuts against the stop I^3 on the forward end of the plate I^2, the tool C then standing in axial alinement with the chuck A and spindle G.

In order to permit of adjusting the guideway or bearing D^3 for the slide D^2 to bring the tool always in proper relation relatively to the stock, I provide a minute adjustment and for this purpose construct the bearing D^3 with a downwardly-extending arm D^6, fitted to slide in a standard P, held to slide transversely on a block Q, fitted to slide longitudinally on the carriage J. A transverse screw-rod R is mounted to turn in a bearing Q', carried by the block Q, and said screw-rod screws in a nut P', formed on the standard P, and on the outer end of the screw-rod is secured a handle R', adapted to be turned by the operator to shift the standard P, and with it the bearing D^3, slide D^2, and tool-post D, in a transverse direction. A similar screw-rod S turns in the carriage J and screws in a nut Q^2 on the block Q to allow the operator to shift the block, and with it the standard and the parts carried thereby, in a longitudinal direction.

In order to raise or lower the bearing D^3 and the slide and tool-post, I provide a shaft T, journaled in the upper portion of the standard P and provided at its outer end with a handle T' and at its inner end with an arm T^2, engaging the under side of the bearing D^2. (See Fig. 4.) Now when the crank-arm T' is turned the arm raises the bearing and the parts carried thereby. The arm D^6 is cut out sufficiently to allow free movement of the arm T^2. (See Figs. 1 and 4.)

In order to automatically lock the carriage J in place on the guideway I' upon returning the carriage after grinding of the tool at the wheel E is accomplished, I provide the device shown in Figs. 5, 6, and 7. On the shaft K is secured an arm K^3, formed at its outer end with a fork K^4, adapted to engage a pawl-shaped arm U on the outer end of a screw-rod U', screwing in the carriage J and engaging the guideway I at a right angle to clamp the carriage in place on the guideway. This takes place shortly after the last tooth of the gear-wheel K' has left the rack J'. When the shaft K is turned in the opposite direction, (see Fig. 7,) the arm K^3 imparts a swinging motion to the arm U to turn the screw-rod U' in an opposite direction to unlock the carriage, and when this takes place the segmental gear-wheel K' again moves in mesh with the rack J' to shift the carriage and the parts carried thereby in a transverse direction to bring the tool opposite the grinding-wheel E for the purpose previously explained.

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

1. In a pearl-button-turning machine, a chuck for holding the stock, and a grinding-wheel arranged at one side of the chuck, in combination with a tool-post mounted to slide longitudinally to bring its tool in and out of engagement with the stock, the tool-post also having transverse movement, to bring the tool in and out of alinement with the stock and in alinement with said grinding-wheel, substantially as shown and described.

2. A turning-machine provided with a tool-post for carrying a tool, means for sliding the tool-post in one direction, means for shifting the tool-post in a direction at an angle to the line of its sliding movement, and a revoluble grinding-wheel having its axis parallel to the line of the shifting movement of the tool-post, substantially as shown and described.

3. A turning-machine provided with a tool-post for carrying a tool, means for sliding the tool-post in one direction, means for shifting the tool-post in a direction at an angle to the line of its sliding movement, a revoluble grinding-wheel having its axis parallel to the line of the shifting movement of the tool-post, and means for raising or lowering the said grinding-wheel relatively to the tool carried by the tool-post, substantially as shown and described.

4. A button-turning machine, comprising a chuck for holding the stock, a grinding-wheel mounted at one side of the chuck, a carriage mounted to travel transversely in front of the chuck and wheel, and a tool-holder mounted to slide on the carriage at right angles to the line of movement of the carriage, as set forth.

5. A button-turning machine, comprising a chuck for holding the stock, a vertically-adjustable grinding-wheel mounted at one side of the chuck, a carriage mounted to slide transversely in front of the chuck and wheel, a slide mounted to slide in the carriage at right angles to the line of movement of the carriage, and a tool-holder carried by the slide, as set forth.

6. A button-turning machine, comprising a chuck for holding the stock, a vertically-adjustable grinding-wheel mounted at one side of the chuck, a carriage mounted to travel transversely in front of the chuck and wheel, means for operating the carriage to bring it opposite either the chuck or wheel, a locking device for locking the carriage in the position into which it has been moved, a slide mounted in the carriage at right angles to the line of movement of said carriage, a tool-holder carried by the slide, and means for operating said slide, as set forth.

7. A turning-machine, provided with a grinding-wheel, a horizontal spindle on which

the wheel is mounted bearing in which the spindle of the wheel is journaled, means for raising or lowering said bearings and the wheel carried thereby, and a tool-post mounted to slide horizontally to bring the tool carried by the post in grinding contact with the peripheral surface of the grinding-wheel, to grind a desired bevel on the tool, substantially as shown and described.

8. A turning-machine, provided with a carriage for the tool-post, a guideway for the carriage to slide on, a rack on said carriage, a segmental gear-wheel in mesh with said rack, and a locking device for locking the carriage on said guideway, said locking device comprising a screw-rod screwing into the carriage against the guideway and means for operating the screw-rod from the shaft of said gear-wheel, substantially as shown and described.

9. A turning-machine, provided with a carriage for the tool-post, a guideway for the carriage to slide on, a rack on said carriage, a segmental gear-wheel in mesh with said rack, a locking device for locking the carriage on said guideway, said locking device being controlled from the shaft of said gear-wheel, and comprising a screw-rod screwing in the carriage against the guideway, an arm on the screw-rod, and an arm on the shaft, for imparting a swinging motion to said screw-rod arm and turning the screw-rod either to the right or left, according to the direction of travel given to the carriage by the gear-wheel, substantially as shown and described.

10. A turning-machine, provided with a tool-post, a slide on which the tool-post is mounted, a bearing for said slide, a standard for supporting said bearing, and a manually-operated device for raising or lowering the bearing and the standard, substantially as shown and described.

11. In a button-turning machine, the combination with a chuck having self-opening jaws and mounted to slide in a spindle and to have its jaws closed thereby, of a tool-carrying slide mounted to slide toward and from the chuck, pivoted levers adapted to be engaged by the chuck and tool-carrying slide respectively, a connection between the levers, and means for operating the slide, as set forth.

12. In a button-turning machine, the combination with a hollow spindle, and a sliding and spring-pressed chuck mounted in the spindle and having self-closing jaws, and provided with a stem or shank projecting beyond the spindle, of a tool-carrying slide mounted to slide toward and from the chuck, pivoted levers adapted to be engaged by the chuck stem or shank and the tool-carrying slide respectively, a link connecting the lever, and means for operating the slide, as set forth.

13. In a button-turning machine, the combination with a carriage, of a tool-carrying support carried by the carriage, means for adjusting the support transversely of the carriage, means for adjusting the support longitudinally of the carriage, and means for raising and lowering said support, as set forth.

14. In a button-turning machine, the combination with a carriage, of a block mounted to slide longitudinally on the carriage, a screw-rod mounted in the carriage and engaging the block, a standard mounted to slide transversely on the block, a screw-rod mounted in the block and engaging the standard, a vertically-adjustable bearing mounted in the standard, and a tool-carrying slide in said bearing, as set forth.

15. In a button-turning machine, the combination with a carriage, of a block mounted to slide longitudinally on the carriage, a screw-rod mounted in the carriage and engaging the block, a standard mounted to slide transversely on the block, a screw-rod mounted in the block and engaging the standard, a bearing for a tool-slide provided with a downwardly-projecting arm sliding in the standard and having an opening therein, and a shaft mounted in the standard and provided at its outer end with a handle and at its inner end with an arm working in the opening of the arm and adapted to engage the said bearing, as set forth.

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