(No Model.)

5 Sheets—Sheet 1.

E. WEYERBUSCH.

MACHINE FOR SHAPING BUTTONS.

No. 311,700. Patented Feb. 3, 1885.

Fig. 1.

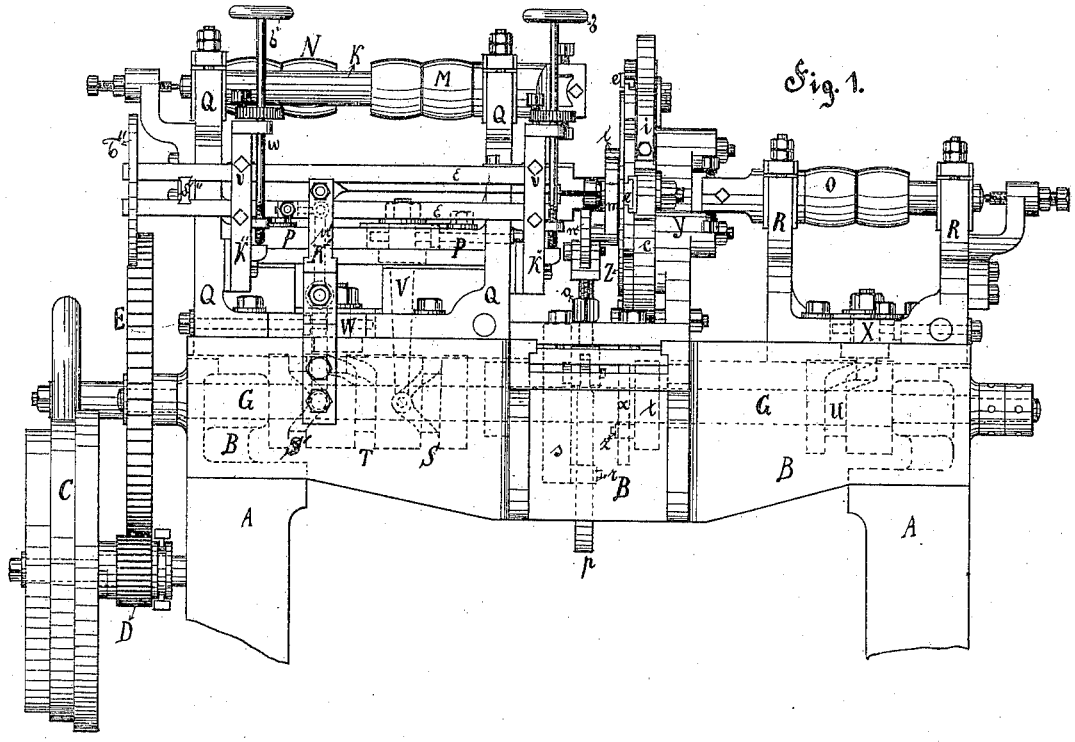

Fig. 2.

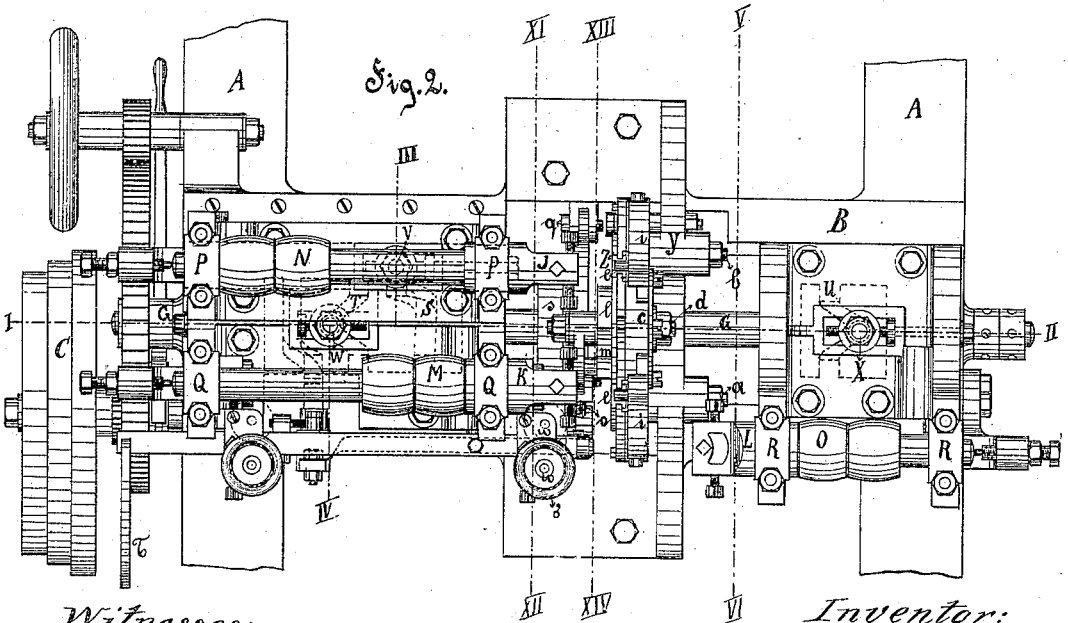

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Fig. 3.

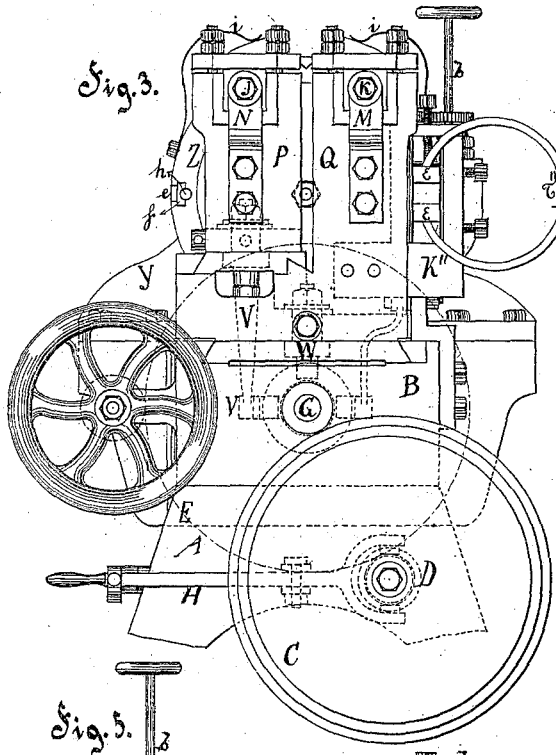

Fig. 4.

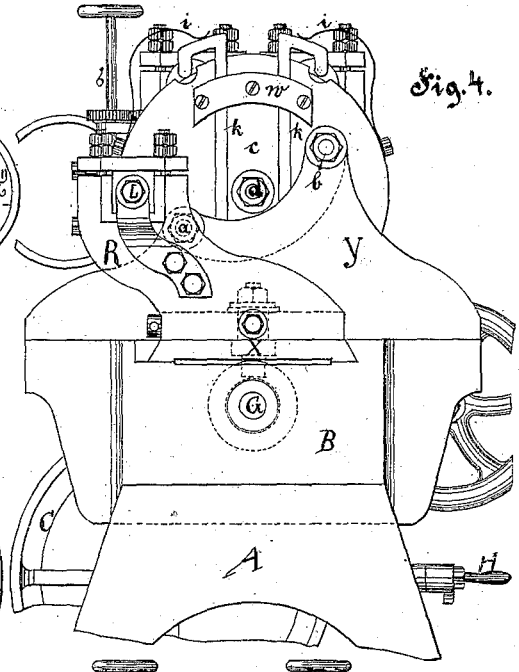

Fig. 5.

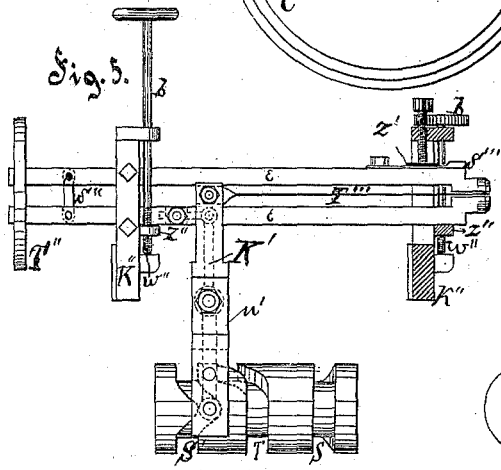

Fig. 6.

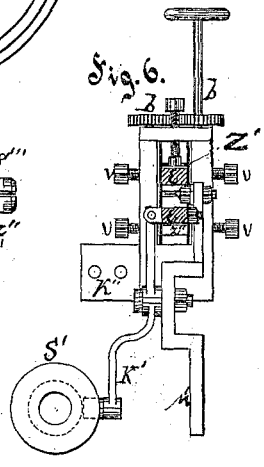

Fig. 7.

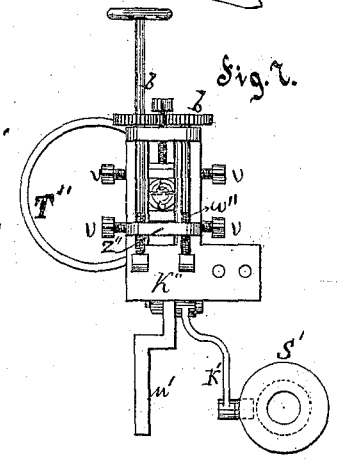

Fig. 8.

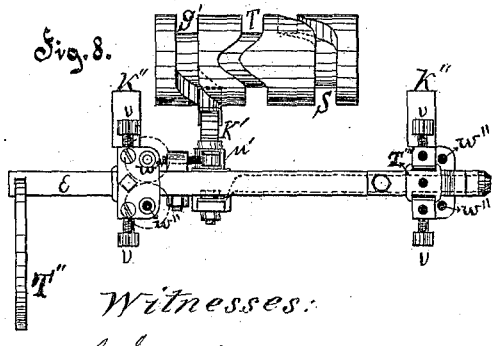

Fig. 9.

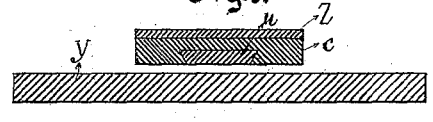

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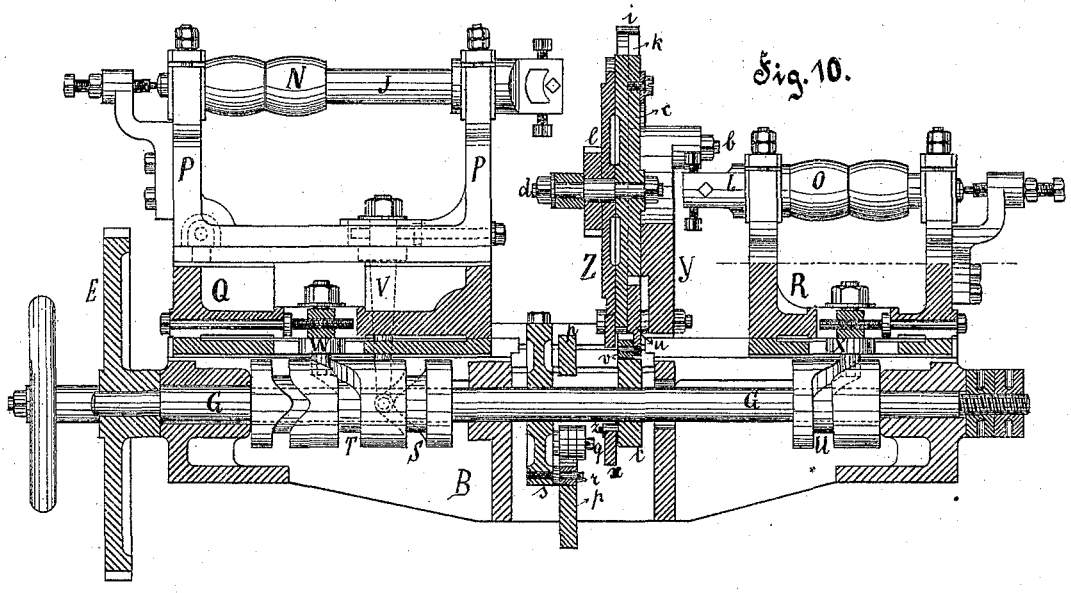
Fig. 10.



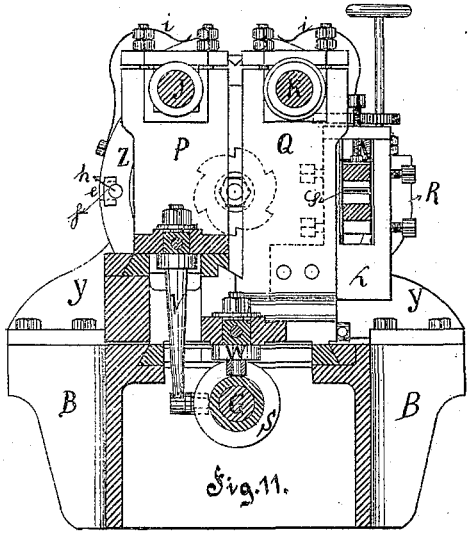


Fig. 11.

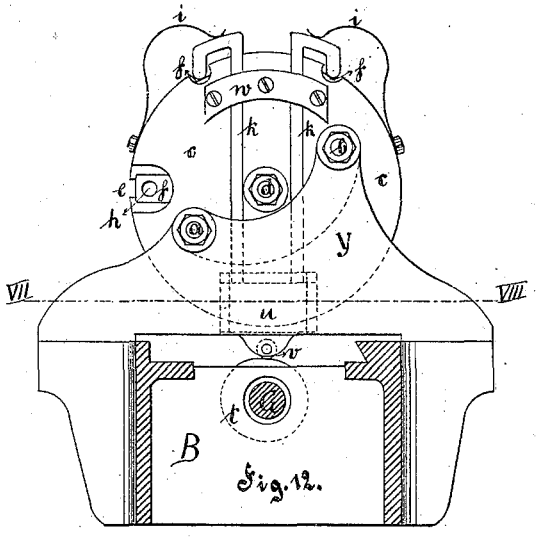


Fig. 12.

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Fig. 13.

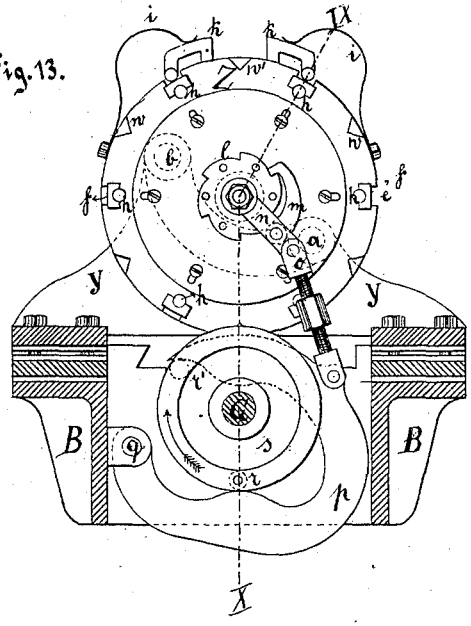


Fig. 14.

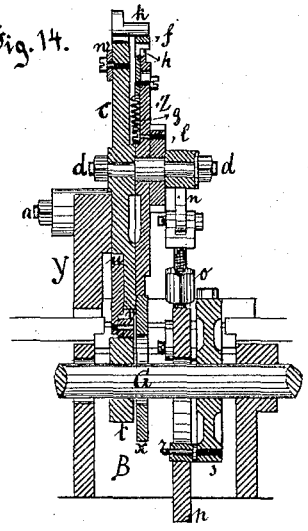
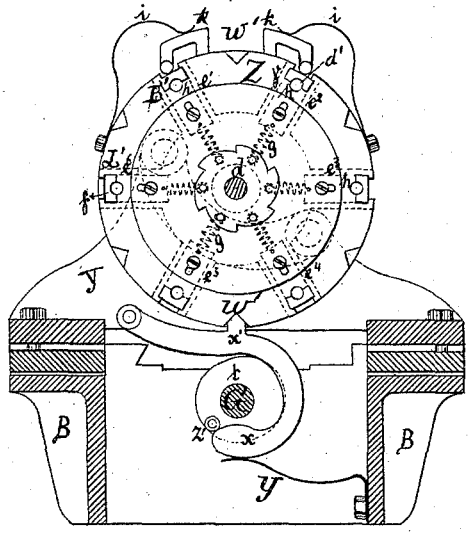


Fig. 15.



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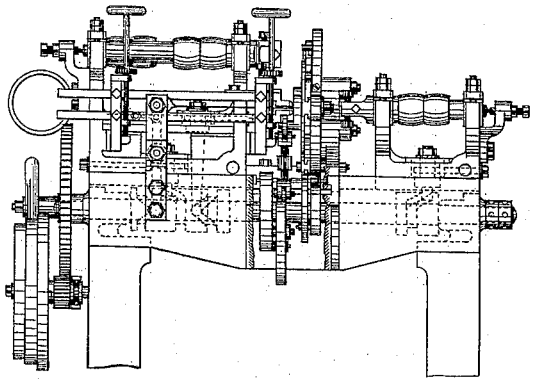
MACHINE FOR SHAPING BUTTONS.

No. 311,700. Patented Feb. 3, 1885.

Fig. 16.



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UNITED STATES PATENT OFFICE.

EMIL WEYERBUSCH, OF ELBERFELD, GERMANY.

MACHINE FOR SHAPING BUTTONS.

SPECIFICATION forming part of Letters Patent No. 311,700, dated February 3, 1885.

Application filed May 6, 1884. (No model.) Patented in Austria-Hungary November 10, 1882, No. 32,753 and No. 45,293, and in Germany October 15, 1883, No. U 200.

To all whom it may concern:

Be it known that I, EMIL WEYERBUSCH, of the firm of Carl Weyerbusch & Co., of the town of Elberfeld, Rhenish Prussia, Germany, have invented a new and useful Improvement in Machines for Shaping Buttons, (for which I have obtained patents in Germany, No. U 200, dated (temporary) October 15, 1883; in Vienna, Austria, No. 32,753, November 10, 1882, and in Pesth, Hungary, No. 45,293, November 10, 1882,) which I call "treble-acting button-revolver lathes," of which the following is a full, clear, and exact description.

A good lathe for turning and boring buttons of ivory-nut, bone, or ivory, and similar materials must answer the following requirements: First, it must finish the button out of the rough without requiring that the material be reset or taken out of the lathe before the button has got its proper shape; second, the acting tools — the cutters — must not suffer much; third, they must act most exactly and without stoppages; fourth, the lathe must be able to turn out a great deal of work of the very best finish; fifth, the lathe must be so constructed that it will not require skilled workmen, and that any laborer can work it. In order to fulfill these requirements I have constructed the machine described hereinafter, and shown in the annexed drawings, of which—

Figure 1 gives a longitudinal elevation; Fig. 2, a plan; Fig. 3, a front view seen from the left side of Fig. 1; Fig. 4, a front view seen from right side of Fig. 1. Figs. 5, 6, 7, and 8 are detailed views of the tongs arrangement for holding the button while its back side is shaped. Fig. 9 is a horizontal section on the line VII VIII of Fig. 12. Fig. 10 is a vertical longitudinal section on line I II of Fig. 2. Fig. 11 is a vertical transverse section on broken line III IV of Fig. 2. Fig. 12 is a vertical transverse section on line V VI of Fig. 2. Fig. 13 is a vertical transverse section on line XI XII of Fig. 2. Fig. 14 is a vertical longitudinal section on line IX X of Fig. 13. Fig. 15 is a vertical transverse section on line XIII XIV of Fig. 2. Fig. 16 is a front elevation.

A are the standards on which the machine is erected. B is the bed, carrying the spindles, head-stocks, and the other working parts of the lathe. The lathe is driven from a suitable head-gear by means of the cone-pulleys C. On the shaft of the latter is fixed the pinion D, which gears into the main spur-wheel E on the shaft G. This shaft G can be set in and out of gear by means of the lever H, which allows the pinion D to be pushed out of gear with the wheel E. The lathe spindles J, K, and L, which are journaled in the head-stocks P Q R, are driven from a head-gear by means of the fast and loose pulleys M N O. The head-stocks Q and R are carried direct upon the bed B of the lathe, in which they can slide in a longitudinal direction. (See Figs. 1, 4, 3, 11, and 10.) The head-stock P, however, finds its bed in the head-stock Q, upon which it can slide forward and backward independently of the movement of Q. The forward and backward motion is given to these head-stocks P Q R by the cam-drums S T U, respectively, on the shaft G, these head-stocks being connected with the cam-drums by means of the arms or pins V W X, at the lower end of each of which there is a little roller, which projects into the groove of the respective cams. Thus by turning the cams the pins V W X must follow the rise and fall of the grooves in the cam-drums, and shift the head-stocks forward and backward or hold them in one place, according to the direction of the grooves in respect to the direction of the axis of the shaft G.

Nearly in the middle of the lathe-bed B is fixed another head-stock, Y, which carries quite central to the three spindles J K L the revolver disk or chuck Z. The construction of this will be more fully described hereinafter. In this revolver disk, which rotates and stops intermittently, the raw material is fastened out of which a button is to be cut, and it is in accordance with its movements or stoppages that the head-stocks P Q R, with their spindles and tools or chisels, are pushed toward the disk, and shape, by their fast rotation, the buttons out of the raw and finish them. Whereby it will be observed that the spindles J and K shape the front side of the button, whereas the spindle L gives the shape or form to the back side, a special contrivance being adopted for this purpose. Let me now de-

scribe the revolver disk and the manner of fastening the material to be worked in it, and also the contrivances for turning and holding fast this disk at the proper moment. To the head-stock Y, Fig. 12, is bolted, by the two bolts *a* and *b*, the guide plate or disk *c*, in the center of which is fastened the pin *d*, Fig. 14. On this pin, in front of the disk *c*, is fitted the revolver disk Z, so that it can be turned round. The fixing of the button material in the revolver disk Z is done in the following manner: In the back side of disk Z are cut the six T-shaped slots *e'* to *e⁶*. Into these slots are fitted the sliding pieces *f*, which form claws. These claws are drawn toward the center by the spiral springs *g*, so that if any piece of material is put between the claw of the sliding piece *f* and the edge of the revolver disk it will be held fast between the two. Suitable recesses are provided for that purpose, in addition, in the edge of the disk and the lower part of the claw, so that if pressed close together the two recesses form a round hole, *h*, as can be seen from Figs. 13 and 15. The piece of ivory-nut when it is first brought into the lathe being very rough and unequal in shape at the sides, and thus opposing at times great resistance to the tools and also when a deep cut is taken, might not be held fast enough by the springs *g* only. The claws are further pressed down for the two first cuts by the strong springs *i*, bolted at one end to the circumference of the fast disk *c*, and pressing with the free end on the presser-bars *k k*.

From the foregoing it will be seen that the material is properly held when the cutters of the spindles J and K are at work, and the working of the machine so far is the following: A piece of raw material—ivory-nut, bone, &c.—is set into the revolver disk at L', the claw *f* being withdrawn by the hand while the revolver is at rest and the nut put below it. Motion is then given to the disk by the ratchet-wheel *l*, which is fixed to its front on the pin *d*, pawl *m*, lever *n*, and rod *o*, the latter being bolted to the oscillating cam-lever *p*, of peculiar shape. This cam-lever has its fulcrum at *q*, and it is so shaped that the little roller *r*, which is fixed to the disk *s*, strikes against it at certain moments, and thus raises it or pushes it downward. The disk *s* is keyed to the shaft G and rotates with it in the direction of the arrow. In the position shown in Fig. 13 the lever *p* has just been pulled down, and rod *o*, lever *n*, and pawl *m* have turned the ratchet-wheel and the revolver disk sixty degrees, or one-sixth of a revolution. The roller *r* leaves the cam-lever now free until it reaches the position *r'*. During this time of rest for the lever and revolver disk a new piece of ivory-nut is fixed at L', while the tools work at B' and *d'*. As soon as roller *r* arrives at the position *r'* it strikes against the cam-lever, raises it in continuing its revolution, and the rod *o*, lever *n*, and pawl *m* are raised, so that the latter falls into the next tooth or notch of the ratchet-wheel, ready to turn it another one sixth of a revolution, when the roller *r* comes in contact with the lever *p* in its proper place and at the required moment of its way. It was said above that the claws *f* are also pressed upon the piece of nut by the springs *i* and the press-bar *k*. These must, therefore, be relieved when the revolver disk shall be turned. Figs. 2, 4, 10, 12, 9, and 14 show the arrangements provided for this purpose. A sliding piece, *u*, is fitted dovetail shaped in the back of the disk *c*, and carries at its bottom side a little roller, V, which stands on the circumference of the eccentric *t*. This eccentric is keyed fast on the shaft G and rotates with it. It is so shaped that it raises the sliding piece *u* at the proper moment, and by this the press-bars *k* are pressed upward, which are also fitted on the back of disk *c*, and held there and guided by the piece *w* and the front side of the head-stock Y. Thus the press-bars leave the disk Z free to turn when required. They are pressed down by the springs *i* as soon as the eccentric *t* allows it. A special arrangement is also provided to hold the revolver disk securely fast and exactly in the proper place while the tools are at work. For this purpose the revolver disk Z is provided at its circumference with notches or gaps *w'*, Figs. 13 and 15, always between two sliding claws, *f*, and a lever, *x*, with a suitably-shaped finger, *x'*, is pressed against the revolver disk by the spring *y*, and falls into the gaps when they come in its way. In order to relieve the revolver disk from this hold when it shall turn, a little roller, *z'*, is fixed to one side of the eccentric *t*, which on its turn strikes against the lower inner part of the lever *x* and presses it down, so that detent *x'* gets out of the gap in Z, and this is free to revolve.

It now remains to describe the contrivance provided to hold the button when it is turned and shaped at the back side by the cutter of the spindle L. This arrangement is shown clearly in Figs. 1 to 8.

It consists of a sort of tongs or nippers, *e*, which are fixed to the head-stock Q and move forward or backward with it, but which at the same time have also an independent motion from the head-stock Q by means of the cam-drum S'. The proper shape having been given to the button by the cutters of J and K, and the revolver having turned the button in the reach of the cutters of L and of the tongs *e*, respectively, these move toward it in advance of the head-stock Q, a greater speed for a time being given to them by the relative position of the grooves in the cam-drums S' and T, so that the tongs while advancing with the head-stock are, besides, pushed forward by the action of the lever K'. The tongs and lever K' are held in place and guided by the brackets K'' and *w'*. The latter are bolted to the bed of the lathe. Set-screws *v* serve for adjusting the tongs at the exact place in lateral direction, whereas the vertical set-screws *w''*, which are worked simultaneously by the hand, and spur-wheels

b serve to adjust them in vertical direction and also to open them more or less, according to the diameter of the button to be held. When the tongs are to be bodily raised by the screws *w''*, which are journaled in the bracket K'' and threaded into the lower guides, Z'', the set-screw of guide Z' must be loosened and readjusted to the new position. When the tongs are thus properly located, the movement of the hand-wheel and rod *b* tends only to open and close the tongs by acting on the lower jaw thereof. The tongs *e* have their support or turning-point in block S'', so that the spring T'' tends always to open them at the right-hand side of Figs. 1, 5, and 8. Adjustable guide-pieces Z' and Z'' prevent undue separation of the tongs, so that the opening be not more nor less than is required. These guide-pieces being fast with the bracket K'', it will be understood that if the tongs *e* are pushed by the lever K' toward the right-hand side the support or turning-point S'' of the tongs will approach Z' and Z'', and thus the tongs will be opened more. The guide-pieces are, of course, set so that the opening corresponds to the size of the button which the tongs shall hold fast. If, then, the tongs have advanced sufficiently that they are within reach of the button, their movement is stopped by shaping the groove in the cam-drum S accordingly, and the head-stock still moves on, so that the guide-pieces Z' and Z'' come to stand nearly to the right end of the tongs S'. It will be seen from Fig. 5 that the upper half of the tongs is provided with an inclined plane or a projecting piece or wedge, S''', so that when the guide-piece Z' reaches this it will press the tongs together very firmly, and they will thus hold the button fast on its front side that it can be finished by the cutters on L at its back. It now only remains to add that while this last cut at the back side of the button is performed, and at the same time the finishing-cut of the front side by the cutters on K, the cutters on J have already been withdrawn according to the relative position of the cam-drum S in regard to the drums T and U, so that the vibrations caused by the cutters on J in cutting the first shape out of the rough shall not be transmitted to the cutters K and L when they make their finishing-cuts, and a thoroughly-clean and well-finished button will be obtained. The button so finished completely must now be taken out of the lathe. This is done automatically in the following manner: The head-stock goes back in advance of the tongs, so these, coming free of the inclined plane S''', are opened by the pressure of the spring T'', and the button is free to fall out; but to prevent its falling toward the tongs there is a plate, T''', fixed between the tongs to the bracket *w'* on the bed B. This, therefore, stands quite immovable, and if the button should happen to remain between the tongs it will be pushed out of them when the button on its way back with the tongs and the head-stock reaches the edge of the plate T'''.

In accordance with the above, I claim as my invention—

The combination, with the head-stock Q, fitted to slide upon the bed B of a button-making machine, and the button-holding tongs *e*, fitted to slide longitudinally in the head-stock of the plate T''', located between the tongs and fixed to the machine relative to the motion of the tongs, substantially as described, whereby a button will be knocked out of the tongs in their retreating motion.

The foregoing specification of my improved machine for turning buttons, called "treble-acting button-revolver lathe," signed by me this 22d day of January, 1884.

EMIL WEYERBUSCH.

Witnesses:

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HEINRICH KRAMER.