

No. 631,677.

Patented Aug. 22, 1899.

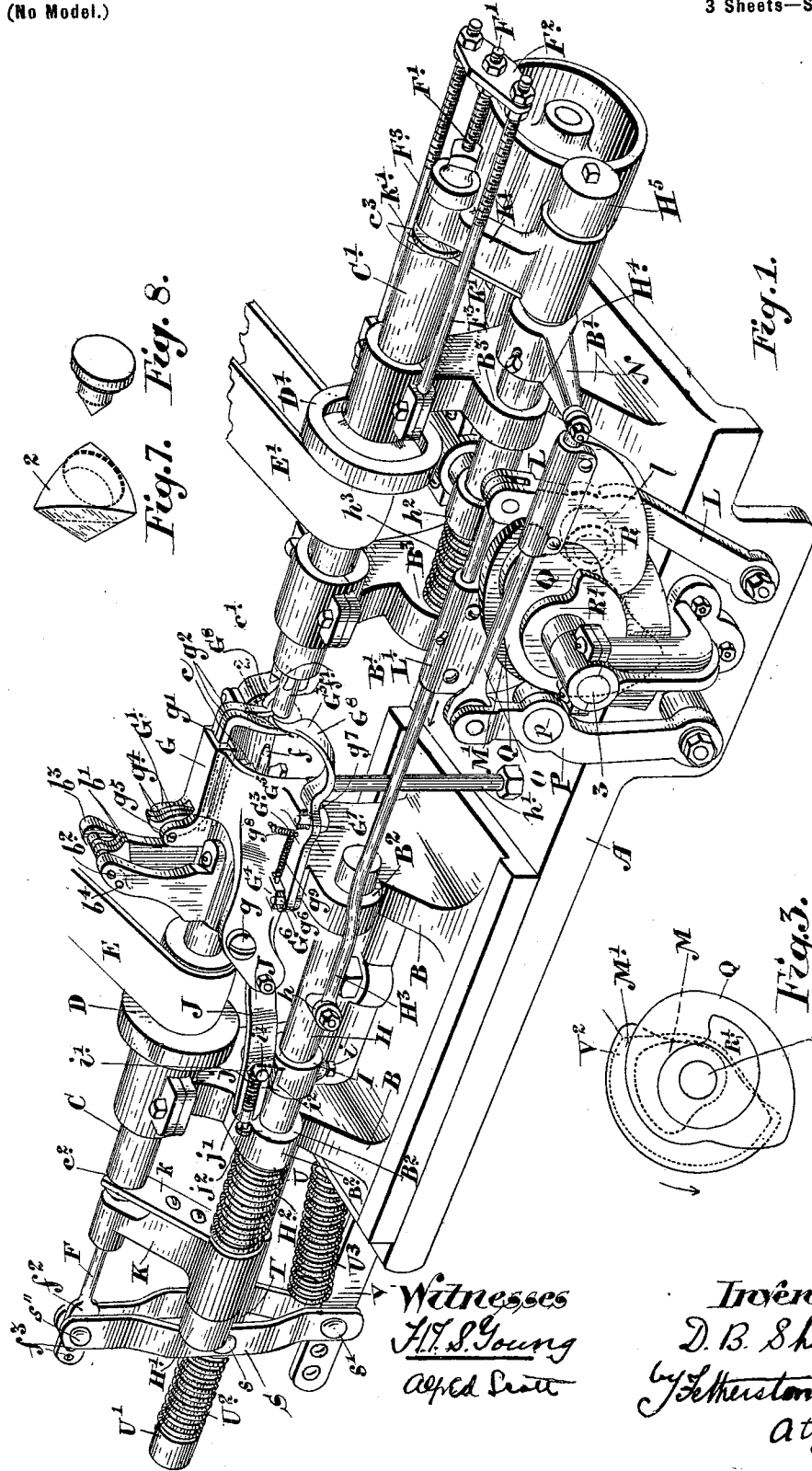
D. B. SHANTZ.

MACHINE FOR CUTTING CIRCULAR DISKS FOR BUTTONS OR THE LIKE.

(Application filed July 20, 1896.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses
J. E. Young
Attest

Inventor
D. B. Shantz
by J. E. Young
Attys.

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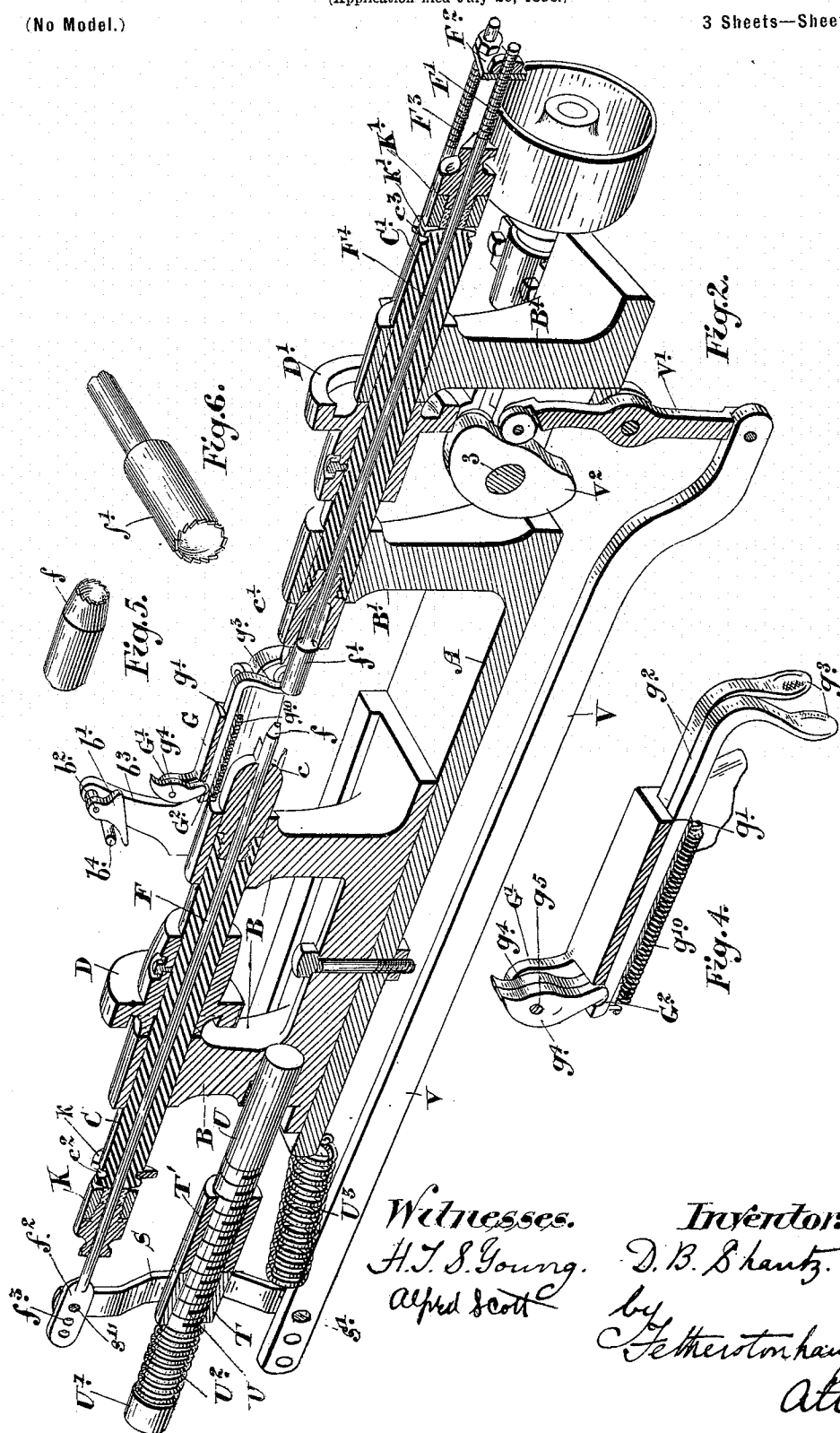
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3 Sheets—Sheet 2.



Witnesses.
H. T. S. Young.
Alfred Scott

Inventor:
D. B. Shantz.
by
Fetherstonhaugh & Co.
Attys.

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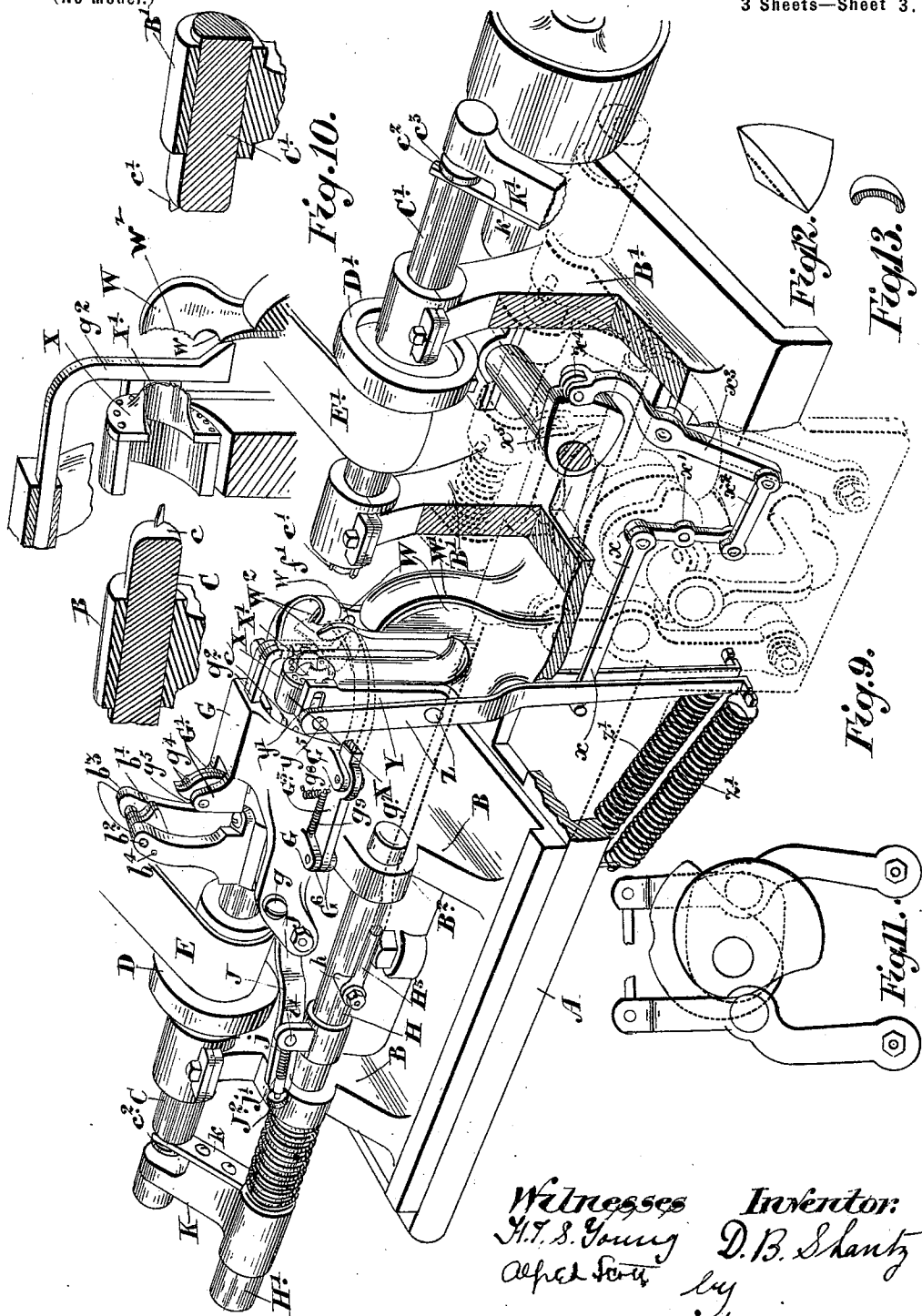
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3 Sheets—Sheet 3.

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Witnesses Inventor:
H. T. S. Young D. B. Shantz
Alfred Fox by
Fetherstonhaugh & Co.
Attys.

UNITED STATES PATENT OFFICE.

DILMAN BRUBACHER SHANTZ, OF BERLIN, CANADA.

MACHINE FOR CUTTING CIRCULAR DISKS FOR BUTTONS OR THE LIKE.

SPECIFICATION forming part of Letters Patent No. 631,677, dated August 22, 1899.

Application filed July 20, 1896. Serial No. 599,944. (No model.)

To all whom it may concern:

Be it known that I, DILMAN BRUBACHER SHANTZ, manufacturer, of the town of Berlin, in the county of Waterloo, in the Province of Ontario, Canada, have invented a certain new and useful Machine for Cutting Circular Disks for Buttons or the Like, of which the following is a specification.

My invention relates to improvements in machinery adapted for the cutting out of circular disk-like blanks, particularly the cutting and formation of disks which are subsequently formed into buttons.

My invention has for its object particularly to improve machines of this character which are adapted to work upon stock of a dense and hard nature—such as vegetable ivory, horn, bone, and pearl-shells—and some of the features of my invention are particularly adapted to the improvement of machines adapted to the cutting of button-blanks from the ivory-nut.

In order that my invention may be the better understood, I have illustrated two embodiments thereof in the accompanying drawings. It should be understood, however, that I do not thereby intend to limit my invention in its useful applications to the particular mechanisms which I have illustrated.

In the said drawings, Figure 1 is a perspective view of a machine embodying my invention and particularly adapted for the cutting of button-blanks from vegetable-ivory stock. Fig. 2 is a sectional perspective view through the machine. Fig. 3 is a side elevation of the preferred arrangement of cams for operating and properly timing the several movements of the machine shown in Fig. 1. Fig. 4 is an enlarged sectional perspective detail of part of the placing mechanism. Figs. 5 and 6 are detail perspective views, enlarged, of the jaws of the holding or gripping rods employed in the machine represented in Fig. 1. Fig. 7 is a perspective view of a piece of vegetable-ivory stock from which has been cut the disk-like button-blank illustrated in Fig. 8. Fig. 9 is a perspective view, partly in section, of another form of my invention. Fig. 10 is an enlarged sectional perspective view of the gripping and cutting devices of the machine shown in Fig. 9. Fig. 11 is an elevation of the form and arrangement of the cams and of

the levers which they operate employed in the machines illustrated in Fig. 9. Fig. 12 is a perspective view of a piece of vegetable-ivory stock, and Fig. 13 is a sectional perspective view of the blank cut therefrom by the last-referred-to machine.

I will first describe the machine illustrated in Figs. 1 to 6.

A represents the bed of the machine, and B B the bearing-standards for the spindle of one cutting-tool, and B' B' the bearing-standards for the spindle of the opposite cutting-tool.

C C' designate the cutter-spindles, and c c' the cutting-tools, which are secured to the inner or adjacent ends of such spindles. It will be understood that the particular form or style of cutters employed will depend upon the article being formed, those illustrated in the drawings being adapted to cut out blanks such as illustrated in Fig. 8.

D D' are the driving-pulleys, secured to the cutter-spindles, and E E' are the driving-belts.

In the form of machine being described the cutter-spindles C C' are hollow longitudinally, and through them and the cutters extend the holding or gripping rods F F'. These rods are provided at their inner ends with grips f f', Figs. 5 and 6, one of which, f', is preferably enlarged, concave at its end, and provided with a serrated circular edge. These gripping devices operate to hold the piece of stock while the tools are cutting the blank therefrom.

It is well known that the grain of the ivory-nut is the finest and of the most dense and uniform texture near the outer surface of the nut and that as the center of the nut is approached cracks and fissures are present. It is therefore of the utmost importance in cutting blanks for buttons from vegetable-ivory stock that the cutting should be so performed as that the exposed face of the button shall be cut from the part of the nut close to the outer edge or surface, and the nearer to the surface the cut is made the better is the quality of the button produced. Heretofore the proper and most advantageous cutting of the button-blank in the manner just referred to has depended very largely upon the individual skill of the workman in properly placing the piece of stock so as to secure the most

advantageous cut, the least possible portion
 of the stock being removed from the outer
 surface thereof consistent with producing a
 smooth surface, while the main cutting ac-
 5 tion to reduce the blank to the proper thick-
 ness was caused to take place on the oppo-
 site side of the blank. One of the purposes
 of my invention has been to produce a ma-
 chine by which I can insure such a cutting
 10 or dressing of the button-blank as has been
 referred to. This I am enabled to accom-
 plish by a peculiar construction and arrange-
 ment of the devices which hold or grip the
 material while it is being operated upon by
 15 the cutter. I make one of the holding de-
 vices perfectly rigid, so that it has a fixed
 immovable relation to the cutters when they
 come into operation upon the material, and
 I make the face or portion of such holding
 20 device which engages with the material so
 that it grips or engages with the material in
 such a manner as to prevent its turning un-
 der the action of the cutters. In this speci-
 25 fication I employ the term "grip" to desig-
 nate a holder of such a character as will pre-
 vent the hard material which is employed in
 the making of buttons from turning under
 the action of the cutters. The rigid grip is
 30 preferably made adjustable, so that its po-
 sition, which is fixed and immovable during
 the cutting operation of the machine, may
 be varied or adjusted relative to the cutters.
 It will be seen that by this arrangement the
 35 operator has merely to place the piece of stock
 securely against such fixed grip with the as-
 surance that when the cutting-tool comes
 into operation the extent to which it cuts
 into the material will be governed by the po-
 sition of such fixed grip or holder.
 40 In the form of machine illustrated in Figs.
 1 to 6, $F' f'$ represent the fixed rigid non-
 rotary grip or holding device. The outer end
 of the rod F' is screw-threaded and extends
 45 through a cross-bar F^2 , which is supported on
 rods $F^3 F^3$, suitably secured to the frame of
 the machine. Clamping-nuts upon the screw-
 threaded portion of the rod F' and bearing
 upon opposite faces of the cross-bar F^2 con-
 50 stitute means whereby the grip f' may be ad-
 justed relative to the cutter c' . The outer
 ends of the rods F^3 may, if desired, be screw-
 threaded, as represented in the drawings,
 and clamp-nuts thereon may be employed for
 55 effecting an adjustment of the rigid grip in
 lieu of the nuts upon the rod F' . I find that
 the best results are obtained when the end of
 the grip f' which engages with the material
 is of as large a size as is consistent with the
 60 use of the particular cutter being employed
 and when its engaging end is so constituted
 as to secure a very firm grip upon the stock,
 as illustrated in Fig. 6. The opposing grip
 f is movable toward and from the stationary
 65 grip f' . I have shown and will presently de-
 scribe means whereby the said movable grip
 is automatically operated.

It will be understood that the pieces of

stock may be placed between the grips by the
 fingers of the attendant and that the ad-
 vantage of having every piece of material
 70 properly positioned to secure the most ad-
 vantageous cut will be secured without the
 attention and skill of the attendant being di-
 rected to that particular object. I prefer,
 however, to provide the machine with auto-
 75 matic means which will serve to place the
 pieces of stock or material to be operated
 upon between the grips or holding-rods.
 Such means consist of a carrier having fin-
 80 gers which grasp and hold the article and
 mechanism which moves the carrier into po-
 sition to place the article between the grips.
 In the form of my invention herein disclosed
 the carrier for the placing-fingers is pivoted,
 so that it moves to place the articles upon
 85 the arc of a circle, and the pivot about which
 it turns is so disposed that the carrier swings
 in a vertical plane, moving upward away
 from the grips and downward to carry the
 piece of stock into position to be grasped by
 90 the grips.

The pieces of the ivory-nut from which the
 blanks are cut are very irregular in shape,
 and it is of the utmost importance that from
 these irregularly-shaped pieces of stock the
 95 blanks should be cut with great precision, as
 the grade of the button finally produced will
 often be determined by the degree of care
 exercised in cutting the blank from the stock.
 By reason of these irregularities in shape in-
 100 cident to the stock employed it has up to this
 time been found impracticable to employ a
 placing device the fingers or grasping parts of
 which engage with the peripheral edges of the
 stock, as when the grasping-fingers are so ar-
 105 ranged it has been found impossible either to
 place the pieces of stock in the placing device
 with such accuracy as is required or to insure
 the pieces of stock being accurately held and
 110 delivered to the grips after they have been
 properly placed. I have overcome the diffi-
 culties which have heretofore rendered an au-
 tomatic placing device impracticable for use
 in a machine adapted to cut button-blanks
 115 from vegetable-ivory stock by so disposing
 the fingers or grasping parts that they engage
 with the opposite faces of the stock, as distin-
 guished from engaging with the peripheral
 edges thereof—that is to say, they engage with
 the same faces as do the grips and the cutters.
 120 This construction I have found to be most
 satisfactory, as it permits the attendant of
 the machine to place the piece of nut very
 carefully and accurately in the placing de-
 125 vice, and when the placing-fingers come into
 engagement with such piece of material they
 do not tend to shift it or displace it, but de-
 liver it with accuracy to the grips. The re-
 sult is that I can use successfully an auto-
 130 matic placing device in a machine for work-
 ing on vegetable-ivory stock. Referring to
 the specific embodiment of this part of my
 invention illustrated in the drawings, G rep-
 resents the carrier, in which are supported

the placing-fingers. It is preferably substantially U-shaped in cross-section and is pivoted at g on the innermost standard B.

g^2 g^3 represent a pair of movable placing-fingers mounted in a suitable support or guideway g' in the upper part of the carrier G. The inner ends g^3 of the said fingers, which engage with the piece of stock or material to be operated upon, are bent downward and are preferably spoon-shaped, as represented in Fig. 4. Each of the fingers is held in a forward position by a spiral spring g^{10} , connected at one end to the carrier and at the other to the finger.

g^4 g^4 are detents pivoted on a pin g^5 in a lug G', attached to or forming part of the carrier G. The upper ends of these detents are curved, as shown, and the lower ends enter recesses G² in the outer ends of the fingers g^2 . (See Fig. 4.)

b' represents a rocking detent pivoted on a pin f^2 , mounted in a bracket b^3 , carried by some stationary part of the machine. The detent b' hangs loosely and has an inclined straight lower edge and a curved rear side, which is designed to come in contact with a stop-pin b^4 when the carrier is moved, so as to bring the detents g^4 into engagement with the lower inclined straight side of the detent b' . When the carrier is swung upward, the effect of the detents g^4 coming into engagement with the detent b' is to throw the fingers g^2 rearward.

G^3 G^3 are arms mounted in the carrier G and shaped to constitute a pair of placing-fingers, which coact with the fingers g^2 in holding the material when being placed between the grips. The arms G^3 are supported in bifurcated lugs G^4 G^5 and are arranged on opposite sides of the carrier G. The arms G^3 should be free to have a certain amount of movement, in order that they may yield to accommodate pieces of stock of different sizes and shapes. I therefore prefer to form them with holes G^6 G^7 , which are larger in diameter than the pins g^6 g^7 , which pass through such holes and operate to secure the arms in the lugs G^4 G^5 .

g^8 and g^9 are springs connected with the arms G^3 and with the carrier G and arranged to hold the arms yieldingly and with their forward ends G^8 , which constitute the placing-fingers, in proper relation to the ends g^3 of the gripping-fingers g^2 .

When the carrier is raised or moved, so as to carry the placing-fingers from between the grips, the fingers g^2 are separated from the fingers G^8 , when a blank or piece of stock 2, such as shown in Fig. 7 and in dotted lines in Fig. 1, may be accurately placed by the attendant between the placing-fingers, which when they come together will grasp the material from opposite sides in the manner hereinbefore set forth, and when the carriage is again properly moved the fingers will operate to place the stock accurately between the grips.

I will now describe means whereby the placing mechanism is automatically operated.

H represents a rod supported in offsets B² from a portion of the standards B'.

I is a collar secured to the rod H by a set-screw i , and J is a link connecting the carrier G with such collar. I prefer that the link J should be provided with a slot j and that the pin i' , which unites the link with the collar I, should pass through such slot and that a spring j' should be mounted in such slot and bear against the pin. A yielding connection is thus interposed between the carrier and its driving mechanism, which operates to prevent straining or breaking of parts. The tension of the spring j' may be regulated by a set-screw j^2 .

H² represents a spiral spring encircling the rod H and situated between the stationary offset B² and an arm K, carried by the rod H. This spring tends to move the rod H into such position as to swing the carrier into position with the placing-fingers between the grip-rods.

H³ represents a connecting-rod interposed between the rod H and a lever L. The lever L is provided with a friction roller or contact l , with which engages a cam M', mounted upon the main cam-shaft 3 of the machine. Another cam M, mounted upon the same shaft, is arranged to engage with a wing L', secured to the rod H³. The cam-shaft 3 revolves in the direction indicated by the arrow in Fig. 3, and when thus moved the cam M, operating upon the wing L', insures that the rods H³ and H shall be moved in the direction of the arrow, Fig. 1, and consequently the carrier moved into position to place the article between the grips. The spring H² would ordinarily effect this movement of the carrier; but I prefer to provide positively-operating means in addition to the spring. The cam M', acting upon the roller l , operates to move the carrier and placing-fingers in a direction opposite to that just described—that is, away from the grips and cutters. These movements of the placing-fingers are repeated regularly, so that the blanks may be fed into position at exactly the proper times to suit the movement of the other parts of the apparatus. In order to limit the movement of the carrier and cause it to come to rest in exactly the right position relative to the grips and cutters, I provide a stop h' , which may be of any suitable construction, a rod with which the movable carrier engages being represented in Fig. 1.

I will next describe the mechanism which I have shown for effecting the movements of the cutter-spindles, whereby the cutters are brought into engagement with the material.

The spindle C is provided with a groove c^2 near its outer end, and with this engages the forked end of a plate k , secured to the arm K, which in turn is carried by the rod H. The upper end of the arm K may be supported by and have movement upon the gripping-rod F, as represented.

It will be readily understood that with an arrangement such as described when the cutter-spindle is moved to bring the cutting-tool into engagement with the stock the carrier 5 is simultaneously moved so as to carry the placing-fingers away from between the grips and the cutters and that when the cutter is moved in the opposite direction the placing-fingers move into position between the grips 10 and cutters.

The other cutter-spindle C' is provided with an annular groove c^3 , with which engages the forked end of a plate k' , carried by an arm K' . The arm K' is carried by a sliding rod H^4 , 15 mounted in offsets B^3 , forming part of the standards B' .

h^2 is a collar secured to the rod H^4 , and h^3 is a spiral spring encircling the said rod and arranged between the collar h^2 and one of 20 the offsets B^3 . The spring h^3 tends to move the rod H^4 so as to retract the cutter c' .

N is an arm secured to the rod H^4 , and O is a rod connecting the arm N with a lever P , which latter carries a friction-roller p , de- 25 signed to be operated upon by the cam Q on the shaft 3.

R represents a wing secured to the rod O and arranged to be acted upon by the cam R' . As will be understood, the cam Q oper- 30 ates to move forward or into cutting position the spindle and its cutter, and the cam R' operates to positively move the parts in the opposite direction.

As has been heretofore stated, the grip f 35 and its carrying-rod F are longitudinally movable toward and from the stationary grip f' , and I will now describe a mechanism for automatically reciprocating the grip f . This grip is advanced—that is to say, moved to- 40 ward the stationary grip—after the placing-fingers have been moved to carry the article into position between the grips and before the cutters come into operation, so that the grips take the piece of stock or material to be operated upon from the placing-fingers, 45 which are moved away during the cutting operation, and securely hold it during the cutting operation, after which they separate to release the blank or piece which has been cut from the stock. The outer end of the grip-rod F is flattened, as at f^2 , and provided with a series of holes f^3 .

S designates a lever, which may be of double strap-metal form, pivotally connected at its 55 upper end to the flattened end of the grip-rod F' at s'' , at its lower end pivotally connected to a reciprocating bar V at s' , and between its ends fulcrumed to a sleeve T at the point s . The sleeve T , which carries the fulcrum of the lever S , is loosely supported 60 upon a rod U , which is suitably supported in the framework of the machine. The rod U is screw-threaded, as represented in Fig. 2, and upon the screw-threaded part thereof 65 is mounted a sleeve or hollow nut T' , which constitutes an adjustable abutment, against which the sleeve T is held by a spring U^2 .

This spring encircles the rod U and is interposed between the sleeve or collar T and a collar or shoulder U' , secured to the rod 70 U . The bar V is pivotally connected to a lever V' , which carries a friction-roller that is arranged to be operated upon by a cam V^2 upon the cam-shaft 3. A spring U^3 is ar- 75 ranged so as to maintain the friction-roller of the lever in proper engagement with the cam V^2 , as will be understood without detailed explanation. The cam V^2 operates to throw or move forward the movable grip at the proper time, and the spring U^3 retracts 80 the grip when the cam has so moved as to permit such action. The spring U^2 operates as a yielding member between the grip f and the cam V^2 , which moves it forward and operates to regulate the force with which the 85 movable grip holds the stock against the fixed or rigid grip, and also operates to prevent breakage or undue strain should a piece of stock of unusual thickness be gripped, and also permits the proper setting of the grip f 90 to suit the thickness of the stock being used. The adjustable abutment T' , against which the movable sleeve T , carrying the fulcrum for the lever S , bears, provides the means for adjusting the grip f . 95

In Figs. 9 to 11 I have represented a form of machine somewhat different from that al- ready described. It is, however, in many of its parts similar to the machine shown in the other views, and I have employed the same 100 letters of reference to designate the parts of the machine which are similar in the two constructions. Thus the placing mechanism and the mechanism for feeding the cutters toward each other is similar in the two forms 105 of machine. The grips or holders for the materials while being cut are different, however, in the two forms of machine, the grips represented in Figs. 9 and 10 being particularly 110 adapted for use in a machine intended to cut a blank of the form indicated in Fig. 13, which differs from that shown in Fig. 8 in that the dressing or cutting of the blank is carried forward to an extent considerably beyond 115 that indicated in Fig. 8. In this form of machine the grips instead of passing axially through the cutters are exterior to the cutters, the cutters working through the grips instead of the grips working through the cutters, as represented in Fig. 2. Each grip is 120 made of two parts or jaws, as indicated in Fig. 9, and these are preferably separated sufficiently to permit the placing-fingers to move into position to carry the material between the grips. The stationary grip W is 125 composed of two pairs of jaws $w w$, each jaw being formed with a concave serrated gripping edge w^2 . These jaws are secured to a bracket or suitable support W' , carried by the frame of the machine. The jaws may be cut 130 away, as at w' , to permit of the proper movements of the placing-fingers g^2 . The movable grip X is preferably formed with two jaws $X' X'$, which are supported in standards Y ,

in which they are arranged to slide. y represents pins carried by the movable grips X and extending outward through slots y' in the standards Y. Z represents levers pivoted to the framework at z and connected at their upper ends to the pins y , and to the lower ends of which are connected the coiled springs z' , which tend to move the levers in a direction to force the movable grip X toward the stationary grip W. The movable grip is retracted or moved away from the stationary grip by a cam x^5 , which acts upon the levers Z through the following train of devices—viz., the friction-rollers x^4 , carried by the lever x^3 , the link x^2 , connecting this lever with another lever x' , and a link x , connecting the lever x' with the levers Z.

In the form of machine just described it will be observed that there is one grip which is non-rotary and has a fixed position with reference to the cutters and that the other grip is movable toward such fixed non-rotatable grip in these respects as well as in others which have been already mentioned, being similar to the machine first described.

What I claim, and desire to secure by Letters Patent, is—

1. In a button-turning machine, in combination, the revolving cutting-spindles, the stationary fingers, and the slidable fingers, substantially as set forth.

2. In a machine for turning buttons, in combination, the revolving spindles, the pivoted carrier, the stationary fingers flexibly held thereto, and the slidable fingers, with means for positively retracting the same, substantially as set forth.

3. In a machine of the class described, the combination with the gripping-jaws, one of which is movable lengthwise to and from the other, of a carrier pivoted on the frame of the machine, holding-fingers to place the blank in position, means for raising the carriage, and a stop for limiting its downward movement, substantially as set forth.

4. In a machine of the class described, the combination with the gripping-jaws, one of which is movable lengthwise to and from the other, of a carrier pivoted on the frame of the machine, longitudinal fingers supported in a guideway in the top of the carriage and having bent lower ends, arms extending out from the carrier in front of the bent ends of the fingers, and means for drawing the bent ends of the fingers back upon the carrier being raised, substantially as set forth.

5. In a machine of the class described, the combination with the gripping-jaws, one of which is movable lengthwise to and from the other, of a carrier pivoted on the frame of the machine, longitudinal fingers supported in a guideway in the top of the carrier, and having bent lower ends, arms extending out from the carrier in front of the bent ends of the fingers, rocking detents suitably pivoted at the rear of the carrier, and having their ends

engaging with the fingers, and means for tilting such detents on their pivots when the carrier is raised, substantially as set forth.

6. In a machine of the class described, the combination with the gripping-jaws, one of which is movable lengthwise to and from the other, of a carrier pivoted on the frame of the machine, fingers supported in a guideway in the top of the carrier, and having bent lower ends, arms extending out from the carrier in front of the bent ends of the fingers, rocking detents suitably pivoted at the rear of the carrier, and engaging with the fingers, and an engaging detent, pivotally supported upon brackets secured to the frame of the machine, and having a limited movement, substantially as set forth.

7. In a machine of the class described, the combination with the gripping-jaws, one of which is movable lengthwise to and from the other, of a carrier pivoted on the frame of the machine, longitudinally-adjustable placing-fingers supported in suitable guideways, and coacting flexibly-held arms having their outer ends extending beyond the ends of the longitudinally-adjustable fingers, substantially as set forth.

8. In a machine of the class described, the combination with the gripping-jaws, one of which is movable lengthwise to and from the other, of a carrier pivoted on the frame of the machine, longitudinally-adjustable placing-fingers supported in suitable guideways, and coacting arms having curved outer ends extending beyond the longitudinally-adjustable fingers, lugs for supporting such arms, pins extending through enlarged holes in the arms and into the lugs, and laterally and longitudinally connecting springs to each arm and the carrier, substantially as set forth.

9. In a machine of the class described, the combination with the gripping-jaws, one of which is movable lengthwise to and from the other, of a carrier pivoted on the frame of the machine, coacting fingers and arms, means for adjusting them to and from each other, a rod supported in suitable bearings in the machine-frame, a link pivotally connected at one end with the carrier, and provided with a slot at the other end, a pin passing through said slot and connecting the link with the said rod, and means for imparting a longitudinal reciprocating movement to such rod, substantially as set forth.

10. In a machine of the class described, the combination with the gripping-jaws, one of which is movable lengthwise to and from the other, of a carriage pivoted on the frame of the machine, coacting fingers and arms, means for adjusting them to and from each other, a rod supported in suitable bearings in the machine-frame, means for flexibly connecting the rod to the carrier, a spring situated on the rod between one of the bearings and a fixed collar on the rod, and means for imparting a longitudinal reciprocating movement to such

rod in the opposite direction to that in which the spring forces the rod, substantially as set forth.

11. In a machine of the class described, the combination with the gripping-jaws, one of which is movable lengthwise to and from the other, of a carrier pivoted on the frame of the machine, coacting fingers and arms, means for adjusting them to and from each other, a rod, H, supported in suitable bearings in the machine-frame, means for flexibly connecting the rod to the carrier, a spring situated on the rod between one of the bearings and a fixed collar on the rod, and the rod H³ pivotally connected to the rod H, the lever L, the roller l, and the cam M' all arranged substantially as set forth.

12. In a machine of the class described, the combination with the gripping-jaws, one of which is movable lengthwise to and from the other, of a carrier pivoted on the frame of the machine, coacting fingers and arms, means for adjusting them to and from each other, a rod, H, supported in suitable bearings in the machine-frame, means for flexibly connecting the rod to the carrier, a spring situated on the rod between one of the bearings and a fixed collar on the rod, and the rod H³ pivotally connected to the rod H, the lever L, the roller l, the cam M', and the wing L', and the cam M, all arranged substantially as set forth.

13. In combination, the cutter-spindles, a longitudinally-reciprocating rod, the connection between said rod and cutter-spindle, the cams, the pivoted lever having a bearing-roller with which engages one of the cams, the rod connecting said reciprocating rod to said lever and the wing arranged on said connecting-rod and designed to bear on the other of said cams, substantially as set forth.

14. In combination, the cutter-spindles, the pair of gripping-jaws, means for advancing and retracting one of said jaws, and means for automatically feeding the blanks between said jaws, said means oscillating vertically in a plane extending longitudinally of the machine, substantially as set forth.

15. The combination with the frame, the cutter-spindles, the gripping-jaws, and means for advancing and retracting one of said jaws, comprising the rod U, having a threaded portion, the sleeve T loose on said rod, the lever S pivotally connected to an extension of said jaw and to said sleeve T, the sleeve T' threaded on said rod, the spring for pressing the sleeve T against the sleeve T', the spring U³ interposed between said lever and the frame, the link connected to the said lever, the lever V' pivotally connected to the opposite end of said link, and the cam acting thereon, substantially as set forth.

16. In a machine for turning buttons and like articles, in combination, the hollow revolving spindles and cutting-tools, non-rotatable rods extending through them, grips or jaws attached to the inner ends of such rods,

one of said rods and grips being stationary and capable of longitudinal adjustment, and the other deriving a predetermined reciprocal movement, substantially as set forth.

17. In a machine of the class described, in combination, the hollow, revolving spindles and cutting-tools, the non-rotatable rods, the stationary grip, the movable grip, and means for adjusting and automatically operating said movable grip, substantially as set forth.

18. In a machine of the class described, the hollow, revolving spindles and cutting-tools, the non-rotatable rods, the stationary grip, and the movable grip, in combination with means for automatically delivering the blanks between the grips, substantially as set forth.

19. In combination, the cutting-tools, the stationary and movable grips, the flexibly-held, temporary placing-fingers, the adjustably-held, temporary placing-fingers, and means for retracting the placing-fingers when the carrier is raised, substantially as set forth.

20. In a machine of the character described, the combination of a hollow revolving spindle and a cutting-tool, a non-rotatable, rigid, gripping device arranged within the said hollow spindle and cutting-tool, and a movable grip, having means to operate it toward and from the rigid grip, substantially as set forth.

21. In a machine of the class described, the combination of a pair of cutters adapted to act upon opposite sides of the material, a stationary, rigid grip for engaging with one side of the material, a grip movable toward and from the stationary grip for engaging with the other side of the material, and means for adjusting the stationary, rigid grip, substantially as set forth.

22. In a machine of the class described, the combination of a pair of cutters adapted to act upon opposite sides of the material, a rigid grip for engaging with one side of the material, a grip, movable toward and from the rigid grip, for engaging with the other side of the material, and means for holding the movable grip in engagement with the material with a yielding pressure or force, substantially as set forth.

23. In a machine of the character described, the combination of the rotary cutters adapted to act on opposite sides of the material, a pair of grips for engaging with and holding the material while the cutters are acting thereon, one of the said grips being movable toward and from the other, means for moving the said grip, and mechanism whereby the extent of movement of such grip may be adjusted or regulated, substantially as set forth.

24. In a machine of the class described, the combination of the cutters adapted to act upon opposite sides of the material, grips for holding the material while the cutters are acting thereon, and automatic means for placing the material between the grips, having parts which engage with the material and grasp it, said parts being arranged to engage with the

same faces of the material as do the grips, substantially as set forth.

25. In a machine of the class described, the combination of the cutters adapted to act upon 5 opposite sides of the material, grips for holding the material while the cutters are acting thereon, means for separating the grips and for bringing them close together, a carrier having parts which engage with and grasp the 10 pieces of material, and automatic means for moving the said carrier, whereby the pieces of material grasped thereby are carried between the grips, the cutters, the grips, and the grasping parts of the carrier being ar- 15 ranged to all engage with the pieces of material from the same sides or faces, substantially as described.

26. In a machine of the class described, the combination of the revolving spindles and cutting-tools, a stationary, rigid grip, a grip movable toward and from the said stationary grip, and automatic means for delivering the pieces of material between the said grips, substantially as set forth.

27. In a machine of the class described, the combination of the revolving spindles and cutting-tools, a stationary, rigid grip adapted to engage with one face of the material while the cutters are acting upon such material, a movable grip for engaging with the opposite face 30 of the material, and automatic means, having parts which engage with the aforesaid opposite faces of the material and thereby grasp it, and which means are arranged to place the material between the aforesaid grips, substantially as set forth.

28. In a machine of the class described, the combination of the revolving spindles and cutters, grips for holding the material while the 40 cutters are acting thereon, a movable carrier, fingers mounted in such carrier, and arranged to grasp the material, means for moving the carrier so as to deliver the material carried by the said fingers between the cutters, and 45 for retracting the carrier, and means for separating the fingers to permit pieces of material to be placed between them when the carrier is retracted, substantially as set forth.

29. The combination of a pair of rotary spindles and cutters, one of the spindles and cutters being hollow, a stationary, rigid grip extending through said hollow spindle and cutter, and an opposite, movable grip, substantially as set forth.

30. The combination of a pair of rotary spindles and cutters, one of the spindles and cutters being hollow, a stationary, rigid, non-rotary grip for engaging with one face of the material, and a movable grip device passing 50 through said hollow spindle and cutter, and

adapted to engage with the opposite face of the material, substantially as set forth.

31. In a machine of the class described, the combination of a pair of hollow, rotary spindles and cutting-tools, a stationary, rigid, non-rotary grip device extending through one of 65 the said hollow spindles and cutting-tools, a movable grip device extending through the other spindle and cutting-tool, and means adapted to reciprocate the movable grip toward and from the stationary grip, substantially as set forth.

32. In a machine of the class described, the combination of the cutters, a stationary grip for engaging with one side of the material while being acted upon by the cutters, a grip 75 for engaging with the other side of the material, and movable toward and from the stationary grip, means for so moving the movable grip, and a spring through which the 80 said grip-moving means operate, whereby the said movable grip engages with the material with a yielding pressure or force, substantially as set forth.

33. In a machine of the class described, the combination of a pair of hollow, rotary spindles and cutting-tools, a stationary, rigid, non-rotary grip device extending through one of 85 the said spindles and cutting-tools, a movable grip and grip-carrying rod extending through the other said hollow spindle and tool, means for reciprocating the last said grip and its rod through the spindle in which it is placed, and a spring through which the said means operate, whereby the said movable grip is caused 95 to act upon the material with a yielding force or pressure, substantially as set forth.

34. In a machine of the character described, the combination of a hollow revolving spindle and cutting-tool, grips for securely holding 100 the material while being operated upon by the cutter, one of said grips passing through said hollow spindle and cutting-tool, and automatic placing means for delivering the material between the said grips, substantially as 105 set forth.

35. In a machine of the character described, the combination of a hollow revolving spindle and cutting-tool, a non-rotatable, rigid gripping device arranged within said hollow spindle and cutting-tool, another gripping device 110 movable toward and from the said rigid grip, and automatic means for delivering pieces of material between the said grips, substantially as set forth.

DILMAN BRUBACHER SHANTZ.

Witnesses:

B. BOYD,

H. T. S. YOUCEY.