

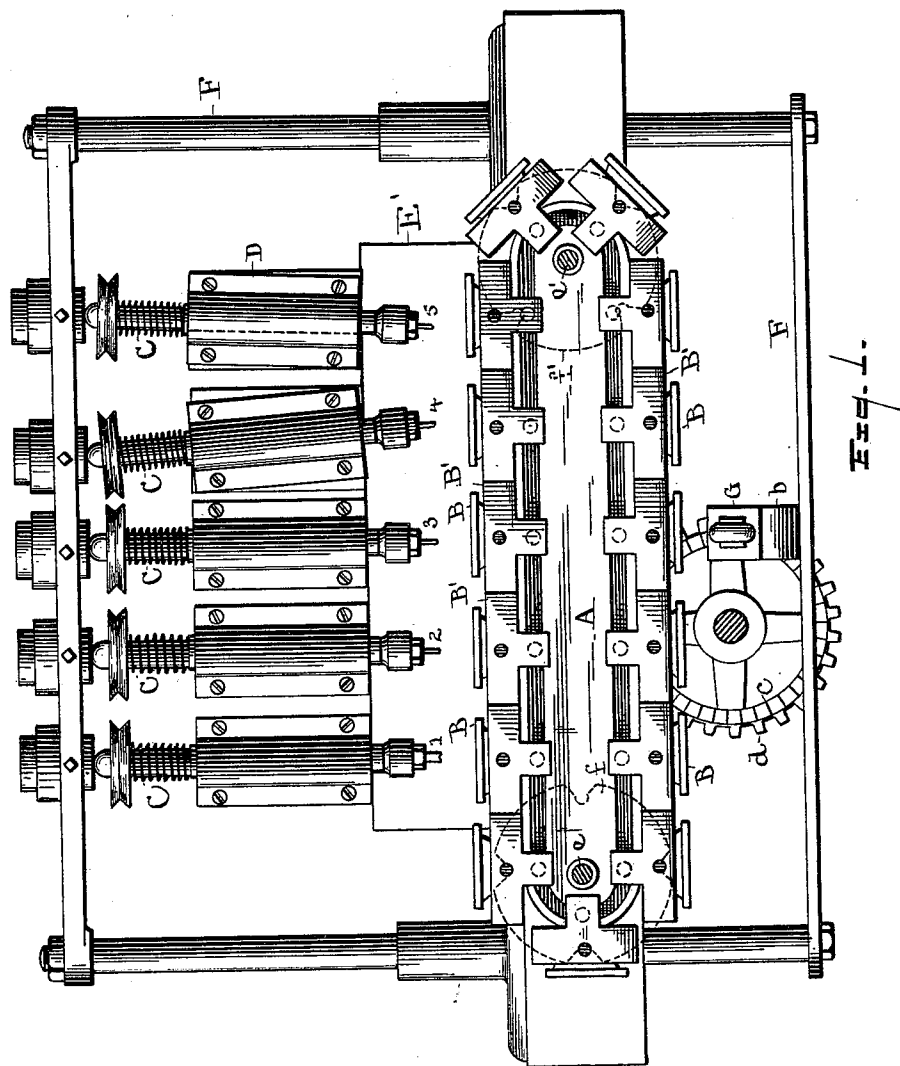
(No Model.)

4 Sheets—Sheet 1.

W. NAGEBORN.
BUTTON MAKING MACHINE.

No. 582,759.

Patented May 18, 1897.



WITNESSES
P. C. Thomas -
W. P. Byer

INVENTOR
Wilhelm Nageborn.
By Syer & Seely
Atty.

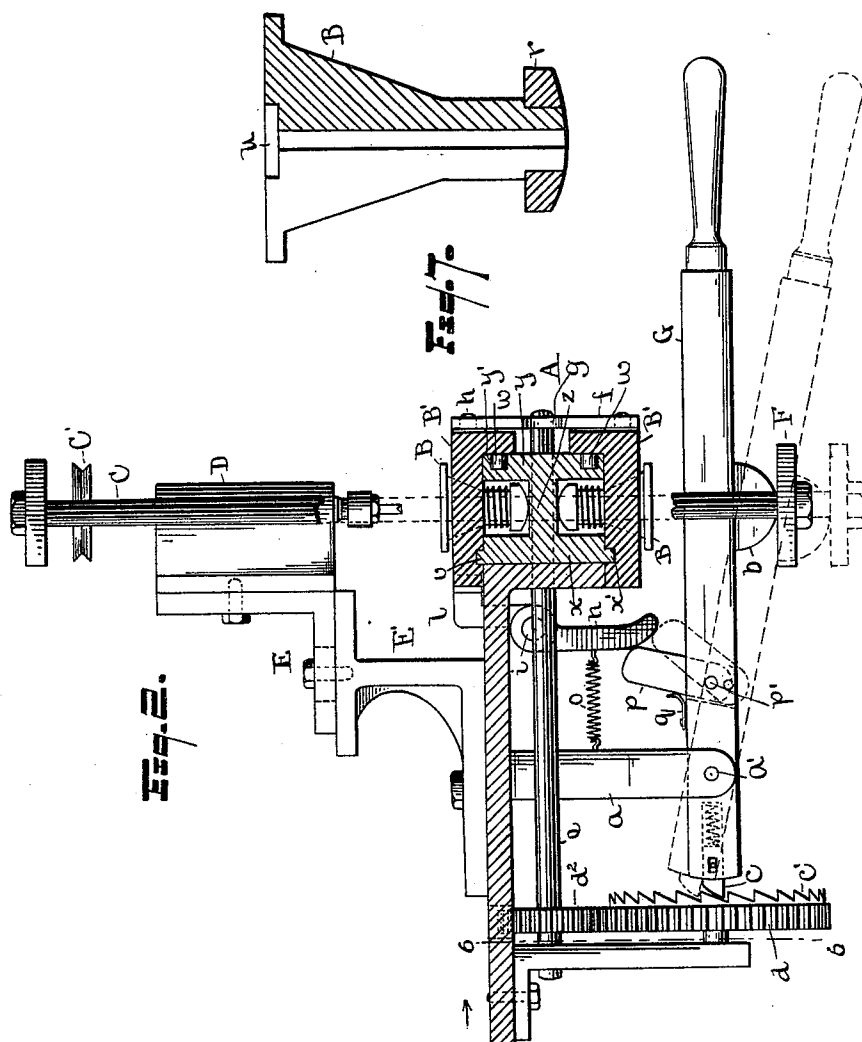
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WITNESSES

J. E. Thomas
W. P. Rye

INVENTOR

Wilhelm Nageborn
By Syer & Seely
Attys

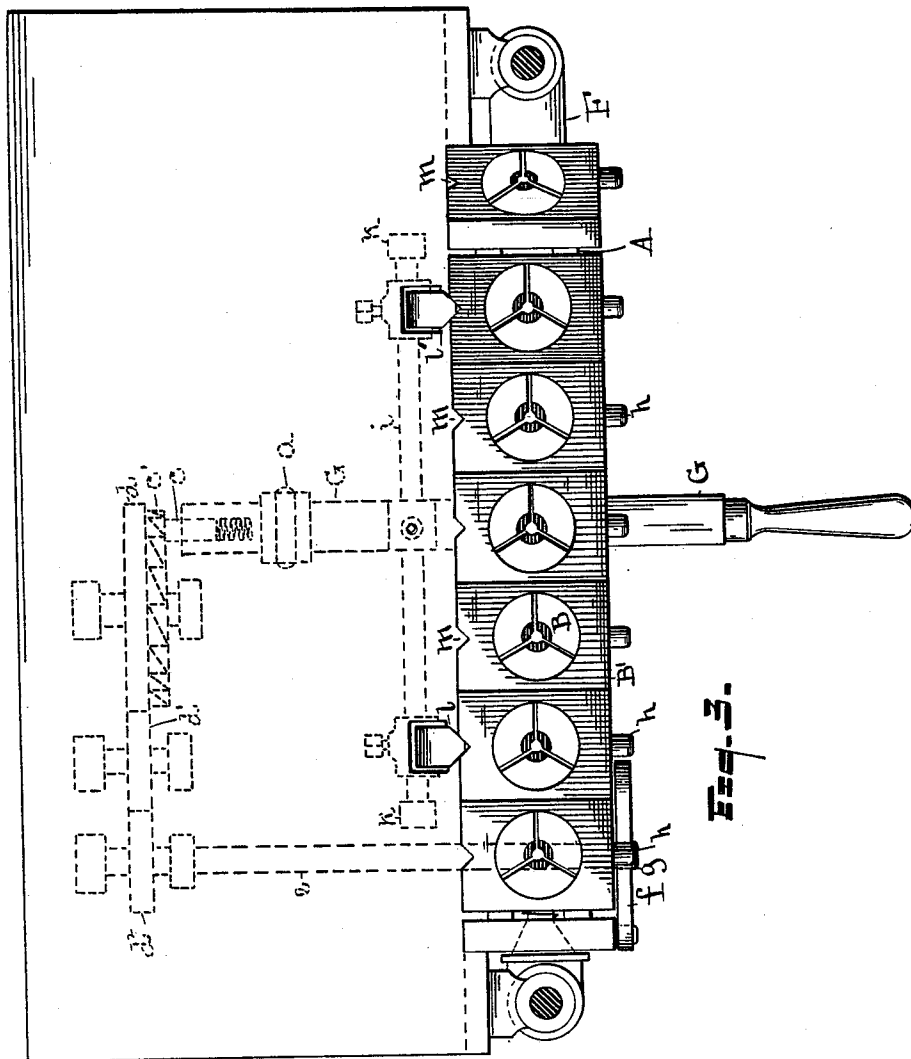
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WITNESSES
S. E. Thomas.
W. Eger

INVENTOR
Wilhelm Nageborn.
By Syer & Seely
Attys.

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4 Sheets—Sheet 4.

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Fig. 4.

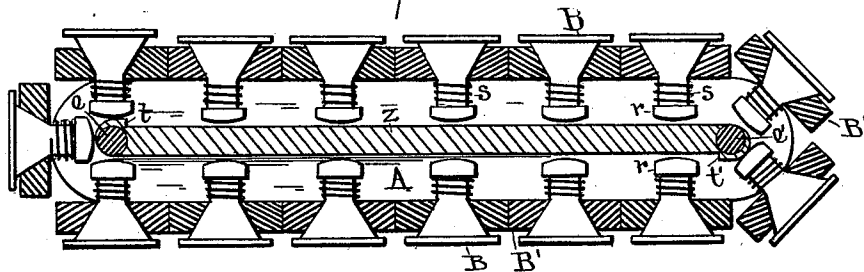


Fig. 5.

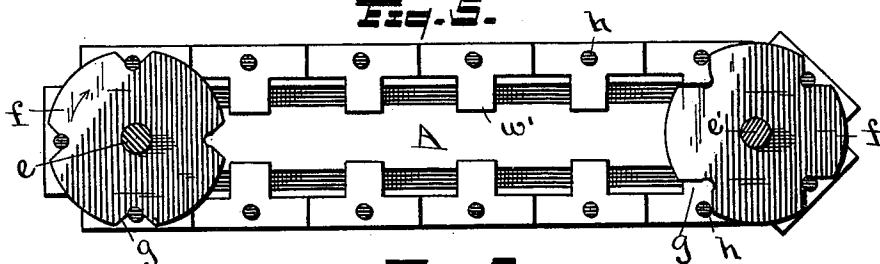
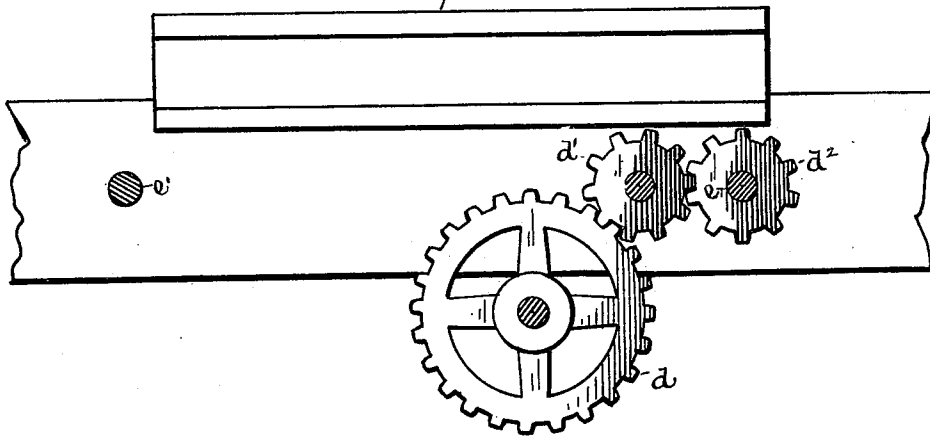


Fig. 6.



WITNESSES

S. E. Thomas—
W. R. Rye

INVENTOR

Wilhelm Nageborn
By Syer & Seely
Attys.

UNITED STATES PATENT OFFICE.

WILHELM NAGEBORN, OF DETROIT, MICHIGAN, ASSIGNOR TO THE STANDARD PEARL BUTTON COMPANY, LIMITED, OF SAME PLACE.

BUTTON-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 582,759, dated May 18, 1897.

Application filed February 9, 1893. Serial No. 461,593. (No model.)

To all whom it may concern:

Be it known that I, WILHELM NAGEBORN, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented a certain new and useful Improvement in Button-Making Machines, of which the following is a specification.

The object of my invention is to reduce the cost of manufacturing buttons, especially those made from mother-of-pearl, although my machine is applicable to the making of buttons from bone, vegetable ivory, and the like; and my invention is an improvement upon machines having a rotating table or support carrying the button-blanks, and particularly upon the machine invented by myself and George Carlyle, upon which an application for Letters Patent was filed May 23, 1892.

In carrying out my invention I provide a machine having several tools performing different operations which act upon two or more button-blanks simultaneously, each blank being operated upon by the different tools in succession, such machine being so constructed and arranged in its several parts that the blanks can be delivered to and removed from the machine with rapidity, and the several operations can be performed quickly and without unnecessary loss of time.

In its general features my machine consists of a series of traveling button-blank-holding chucks traveling, preferably, over and under or around a stationary table or support, the chucks being opened and closed at the proper intervals by the forward movement of the whole series. Above these traveling chucks and in line therewith are supported the rotating forming, centering, and drilling tools. These tools are held in chucks placed upon rotating spindles which are capable of a vertical movement toward and away from the traveling button-holding chucks simultaneously, which movement is imparted to them by a suitable frame which also acts as an end bearing for the spindles. This frame is depressed by a lever moved by the operator to bring the tools in position to act upon the blanks simultaneously, and when the operation is performed the frame and tools are returned to their normal positions by the pressure of the springs

coiled around the spindles. The upward movement of the lever operates to release the pawls engaging with the traveling button-holding chucks and operates the mechanism for moving said chucks, so that upon the next downward movement of the operating-lever the respective tools will act upon the next blank. Thus the different tools will act successively upon each blank and simultaneously upon different blanks. At the point where the blank is to be placed in the chuck the chuck rides over a cam situated in its path, which gives it an outward movement in its block, thus allowing its jaws to open. The blank is then inserted, and as the chucks are shifted along by the return movement of the operating-lever the one which has just received a blank rides off the cam and is forced backward in its block by means of a spring. The blank is then firmly held by the chuck. To release the completed button, the chuck rides over a similar cam placed so as to operate at a point under the table, so that when the grip on the button is released the button will drop out.

In the accompanying drawings, Figure 1 is a front elevation of the machine; Fig. 2, a partial cross-section and side elevation; Fig. 3, a top plan view, the tool spindles and supports and frame being omitted; Fig. 4 a central longitudinal section of the table and blocks of the blank-holding chucks, the chucks being shown in elevation; Fig. 5, a separate elevation of the table and blocks of the blank-holding chucks and of the notched wheels which impart motion to the chucks; Fig. 6, an elevation taken on the line 6 6 of Fig. 2, looking in the direction of the arrow, some of the parts being omitted; and Fig. 7, a section through one of the button-blank-holding chucks.

A is the table or support, constructed, preferably, of the form shown, and over or around which the blank-holding chucks B travel.

B' are the chuck blocks or seats.

The table or support A in cross-section is constructed in the form of the letter H, as shown in Fig. 2, and rounded at the ends, as shown in Figs. 1 and 4. The side x has a flange x' all around it which fits into slots v on the blocks B'. The other side of the table

y has a channel *y'* all around its outer side, and in this channel travel pins *w*, which are rigidly held in the extensions *w'* of the chuck-blocks *B'*. The chucks extend between the sides of the table, and on the web *z*, connecting the sides of the table, are formed the cams *t* and *t'*, before referred to. The channel *y'* and pins *w* serve to guide the chucks and seats around the table and also prevent them from falling away from the table as they pass under it.

C are the spindles carrying the tools 1 to 5 and rotated by belt connection with the pulleys *C'*, and *D* are the bearings through which the spindles work.

The bearings *D* are secured by screw-bolts to the supports *E* and *E'*, so that the spindles may be given different positions relative to the button-blanks, as shown in Fig. 1.

F is the frame by the depression of which the tools carried by the spindles are brought into operative position.

The operating-lever *G* is pivoted at *a'* to the post *a* and is provided with a rounded lug *b*, resting on the lower cross-bar of the frame *F*. At the short end of the lever is a socket in which is placed a spring-projected pawl *c*, which engages with the ratchet-teeth *c'* on the gear-wheel *d*. The wheel *d* meshes with the pinion *d'*, which pinion meshes with the pinion *d''* on the shaft *e*. The shaft *e* passes through the table *A* and carries the notched wheel *f*. A similar wheel *f'*, Fig. 5, is carried by the shaft *e'*, mounted in bearings at the opposite end of the table. The notches *g* on these wheels engage with the pins *h* on the seats of the traveling chucks. Under the top plate of the machine is a rock-shaft *i*, supported in bearings *k*. This shaft carries locking-dogs *l* and *l'*, which extend through openings in the top plate and engage with the notches *m* in the chuck-blocks *B'*. Projecting downwardly from the rock-shaft *i* is an arm *n*, and between this arm and post *a* is placed spring *o*. This spring acts to throw the dogs *l* and *l'* into the notches *m*. Pivoted at *p'* on the lever *G* is a dog *p*, which is thrown forward by a light spring *q*, secured to the lever *G*.

The button-blank-holding chuck is formed, preferably, of three jaws, tapered on their outer surfaces for a portion of their length and held together at their lower ends by a collar *r*. An opening is formed through the center of the chucks into which the drilling-tools enter after passing through the blanks. When each chuck rides up onto the cam *t*, it is forced outward and the jaws of the chuck will separate slightly, and the button-blank is then placed in the recess *u*. A spring *S* is coiled around the cylindrical portion of each chuck between the collar *r* and the under side of the chuck-blocks, and when each chuck rides off the cam the spring forces the chuck back into the block, and by reason of the taper given the jaws of the chuck and the corresponding incline of the block the spring

action will wedge the jaws together until they have a firm hold on the button-blank. When each chuck rides up onto the cam *t'* the same action takes place and the button will drop out.

The operation of the machine is as follows: A blank is inserted in the chuck which is at the moment on the cam *t* and the lever *G* is moved downward. The downward movement of the lever will cause the frame *F* to move downward, and consequently the tools 1 to 5. As will be seen in Fig. 2, the dog *p* is held against the arm *n* by the spring *q* when the lever *G* is in its normal position. The pressure of the dog *p* against the arm *n* in this position does not affect it, as the spring *q* is of much less tension than the spring *o*. In moving the lever *G* downward the inclined meeting surfaces of the dog *p* and arm *n* will slide past each other, and as the dog *p* clears the arm *n* the spring *q* will throw the dog *p* to the forward limit of its movement. The position of the lever *G* and the pawl *c* and dog *p* are now as shown in dotted lines in Fig. 2. This is the position when the tools are operating upon the blanks. There being, however, no blanks under the tools the lever is returned to its normal position to shift to the next position the chuck which has just received a blank. That is accomplished by raising the lever *G*, causing the pawl *c* and dog *p* to act simultaneously upon the teeth *c'* and arm *n*, respectively. The pressure of the dog *p* upon the arm *n* starts the pawls *l* from the notches, and the power exerted on the wheel *d*, through the teeth *c'* and pawl *c*, will rotate the wheel *f*, and consequently shift the blocks *B'*. The pawls *l* and notches *m* being wedge-shaped the dog *p* simply acts to start the pawls *l* by its upward pressure on the slightly-curved end of the arm *n*, the pawls *l* being forced entirely out of the notches by the shifting of the blocks *B'*. In the meantime the dog *p* will have been forced backward against the pressure of spring *q* by the further movement of the lever *G*, this being accomplished by the inclined meeting surfaces of the arm *n* and dog *p*. The pressure of the spring *o* will keep the pawls *l* against the blocks *B'* and force them into the notches of the succeeding blocks when they have been moved the proper distance. The next chuck is then in position to receive a blank, and as the lever *G* is moved downward tool 1 will operate upon the first blank inserted. When the operation is completed, the lever is returned, with the same result as before. This will place another chuck in position to receive a blank, and upon moving the lever downward again tool 2 will operate upon the first blank and tool 1 will operate upon the second. When this operation is completed, the lever is returned, as before, to its normal position and another chuck stands ready to be fed with a blank and the operation repeated. When the first blank inserted has been operated upon by tool 5, it is ready to

be dropped from the chuck, and this is done when the chuck rides onto the cam *t'*.

I do not limit myself herein to the use of the precise form of the table and button-holding chucks shown and described, as the same may be altered without departing from the spirit of my invention. Instead of the flat table shown a circular or oval-shaped support for the chucks may be employed, the operating-tools being placed at the proper angles.

What I claim is—

1. In a button-making machine, the combination with two or more rotating tools, of a series of traveling blank-holding chucks traveling with respect to and over a stationary approximately flat bed and in the same plane but across the path of movement of the rotating tools, means for bringing said tools into position to act upon the blanks, and a cam situated in the path of said chucks for opening the same to receive and discharge the blank and button, substantially as set forth.

2. In a button-making machine, the combination with two or more rotating tools, of a series of traveling blank-holding chucks traveling with respect to and over a stationary approximately flat bed and in the same plane but across the path of movement of the rotating tools, a lever for bringing said tools into position to act upon the blanks and mechanism operated by the return movement of said lever to shift the blank-holding chucks, substantially as set forth.

3. In a button-making machine, the combination with two or more rotating tools, of a series of traveling blank-holding chucks traveling with respect to and over a stationary approximately flat bed and in the same plane but across the path of movement of the rotating tools, a cam situated in the path of said chucks to open the same to receive a blank, a lever for bringing the tools into position to act upon the blanks, mechanism operated by the return movement of said lever to shift the chucks, and a cam for opening the chucks to discharge the blanks, substantially as set forth.

4. In a button-making machine, the combination with two or more rotating tools, of a series of traveling blank-holding chucks traveling in the same plane but across the path of movement of the rotating tools, a lever for bringing the tools into position to act upon the blanks, locking-dogs engaging with the chucks, and mechanism operated by the return movement of said lever to shift the chucks, substantially as set forth.

5. In a button-making machine, the combination with two or more rotating tools, of a series of traveling blank-holding chucks traveling in the same plane but across the path of movement of the rotating tools, a lever for bringing the tools into position to act upon the blanks, locking-dogs engaging with the chucks, said lever in its return movement assisting in disengaging said dogs from the

chucks and simultaneously operating mechanism to shift the chucks, substantially as set forth.

6. In a button-making machine, the combination with two or more rotating tools, of a series of traveling blank-holding chucks traveling with respect to and over a stationary support and in the same plane but across the path of movement of the rotating tools, a cam situated in the path of said chucks for opening same to receive a blank, a lever for bringing said tools into position to act upon the blanks, locking-dogs engaging with the chucks, said lever in its return movement assisting in disengaging said dogs from said chucks, and simultaneously operating mechanism to shift the chucks, and a cam for opening said chucks to discharge the button, substantially as set forth.

7. In a button-making machine, the combination with two or more rotating tools, of chucks B traveling across table A, lever G for bringing said tools into position to act upon the blanks, wheels *f* and *f'* engaging with pins *h* on the chuck-blocks B', and gearing connecting said wheel *f* with the lever G by the return movement of which the wheel *f* is rotated to shift the blank-holding chucks, substantially as set forth.

8. In a button-making machine, the combination with two or more rotating tools, of the chucks B traveling across the table A, lever G for bringing said tools into position to act upon the blanks, wheels *f* and *f'* engaging with pins *h* on the chuck-blocks B', gearing connecting said wheel *f* with the lever G by the return movement of which the wheel *f* is rotated to shift the blank-holding chucks, a cam *t* in the path of said chucks to open same to receive a blank, and a cam *t'* to open said chucks to discharge the button, substantially as set forth.

9. In a button-making machine, the combination with two or more rotating tools, of chucks B traveling across table A, lever G for bringing said tools into position to act upon the blanks, pins *h* on the blocks B', wheels *f* and *f'* engaging with said pins, gearing connecting wheel *f* with lever G, notches *m* on the blocks B', and dogs *l* and *l'* engaging with said notches, said gearing being actuated and said dogs being removed from the notches simultaneously, by the lever G in its return movement, substantially as and for the purpose set forth.

10. In a button-making machine, the combination with two or more rotating tools, of chucks B traveling across table A, lever G for bringing said tools into position to act upon the blanks, pins *h* on the blocks B', wheels *f* and *f'* engaging with said pins, gearing connecting wheel *f* with lever G, notches *m* on the blocks B', locking-dogs *l* and *l'* engaging with said notches, arm *n* extending from shaft *i*, and dog *p* carried by lever G, said gearing being actuated and dog *p* caused to engage

with arm *n*, simultaneously, by the lever *G* in its return movement, substantially as and for the purpose set forth.

11. In a button-making machine, the combination with two or more rotating tools, of chucks *B*, traveling across table *A*, lever *G* for bringing said tools into position to act upon the blanks, pins *h* on the blocks *B'*, wheels *f* and *f'* engaging with said pins, gearing connecting wheel *f* with lever *G*, notches *m* on the blocks *B'*, dogs *l* and *l'* engaging with said notches, said gearing being actuated and said dogs being removed from the notches, simultaneously, by the lever *G* in its return movement, and cams *t* and *t'* for opening chucks *B*, substantially as set forth.

12. In a button-making machine, the combination with two or more rotating tools, of chucks *B* traveling across table *A*, lever *G* for bringing said tools into position to act upon the blanks, pins *h* on the blocks *B'*, wheels *f* and *f'* engaging with said pins, gearing connecting wheel *f* with lever *G*, notches *m* on the blocks *B'*, locking-dogs *l* and *l'* engaging with said notches, arm *n* extending from shaft *i*, dog *p* carried by lever *G*, said gearing being actuated and dog *p* caused to engage with arm *n*, simultaneously, by the lever *G* in its return movement, and cams *t* and *t'* for opening chucks *B*, substantially as and for the purpose set forth.

13. In a button-making machine, the combination of table *A*, chucks *B*, carried in seats *B'*, having pins *h* and notches *m*, rotating forming and drilling tools, frame *F*, lever *G*,

notched wheels *f* and *f'*, wheel *d* carrying teeth *c'*, gearing connecting wheels *f* and *d*, pawl *c* carried by lever *G*, dogs *l* and *l'*, arm *n*, and dog *p*, all arranged substantially as and for the purpose set forth.

14. In a button-making machine, the combination with two or more rotating tools of the table *A*, chucks *B* carried in seats *B'*, channel *y'*, pins *w* projecting from seats *B'* and working in said channel, and means for shifting said chucks around said table, substantially as set forth.

15. In a button-making machine, the combination with two or more rotating tools, and a stationary support, of blank-holding chucks arranged to travel around said support, means for shifting said chucks around said support, a guide for said chucks, and cams on said support for opening said chucks, substantially as set forth.

16. In a button-making machine, the combination of table *A*, chucks *B* carried in seats *B'*, channel *y'*, pins *w* projecting from seats *B'* and working in said channel, means for shifting said chucks around said table, and cams *t* and *t'* at each side of said table for opening said chucks, substantially as set forth.

This specification signed and witnessed this 4th day of February, 1893.

WILHELM NAGEBORN.

Witnesses:

FRED C. HARVEY,
H. W. LARKINS.