(No Model.) 2 Sheets—Sheet 1.

G. S. BEERS.

MACHINE FOR TURNING BUTTONS.

No. 304,065. Patented Aug. 26, 1884.

Fig1.

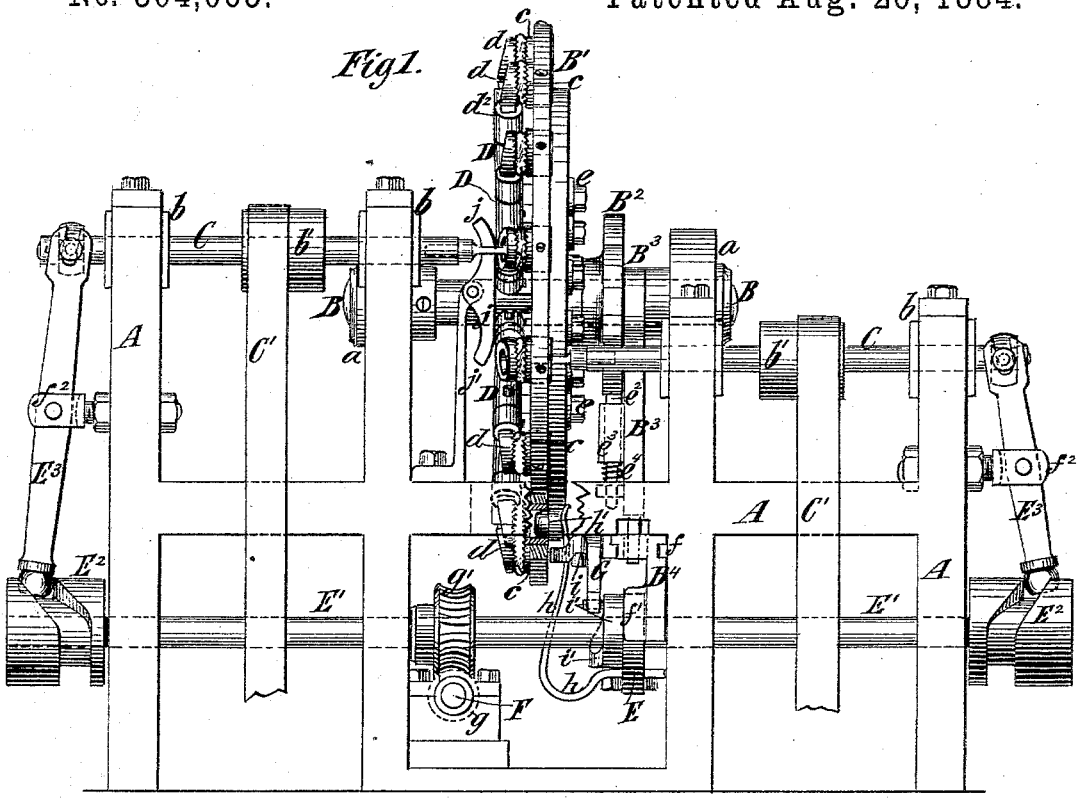
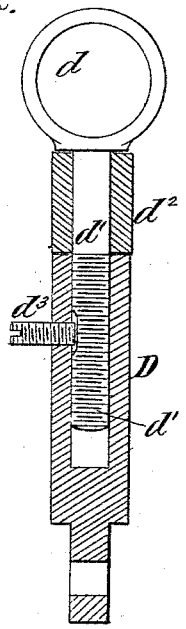


Fig2.



Witnesses
Ed. L. Moran
C. F. Sundgren

Inventor
George S. Beers
by his Attorneys
Brown & Brown

(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

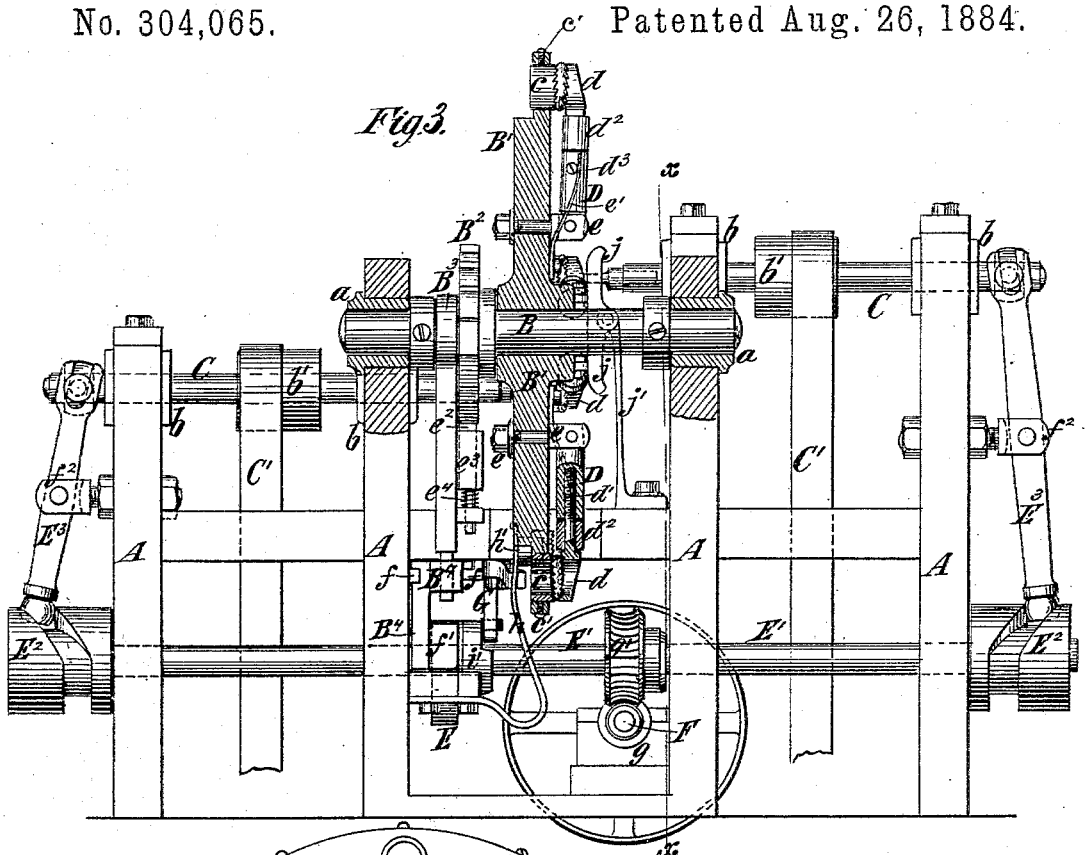
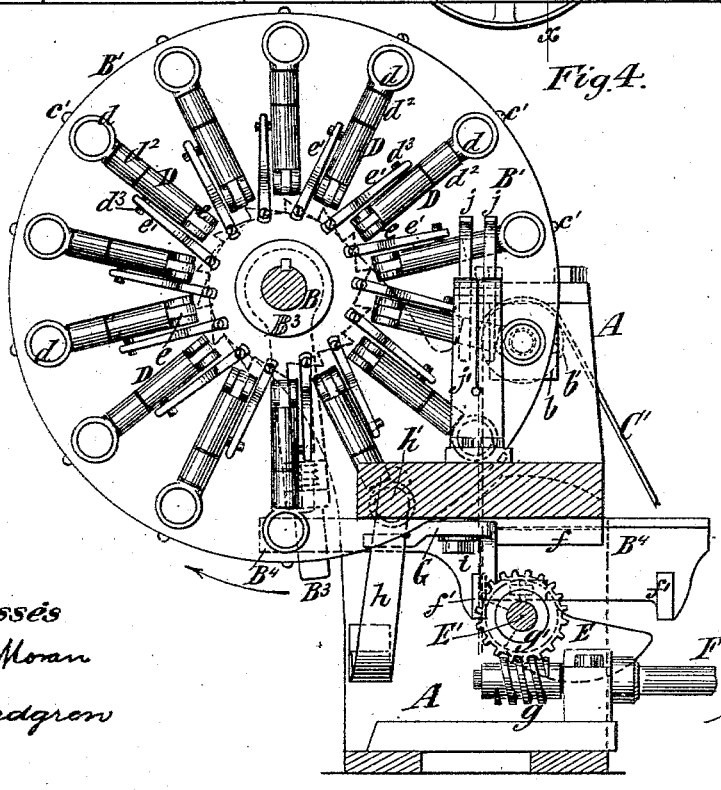


Fig. 4.



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UNITED STATES PATENT OFFICE.

GEORGE S. BEERS, OF NEW MILFORD, CONNECTICUT.

MACHINE FOR TURNING BUTTONS.

SPECIFICATION forming part of Letters Patent No. 304,065, dated August 26, 1884.

Application filed September 20, 1883. (No model.)

To all whom it may concern:

Be it known that I, GEORGE S. BEERS, of New Milford, in the county of Litchfield and State of Connecticut, have invented a new and useful Improvement in Machines for Turning Buttons, of which the following is a specification.

In making buttons from vegetable ivory the nuts are sawed into slabs or blocks, and these slabs or blocks are placed in a chuck, which holds them stationary while their opposite sides are operated on by rotary turning-tools.

The principal objects of my invention are to provide a machine in which buttons may be turned out from vegetable ivory and other substances more rapidly than in the machines heretofore in use, and which is so constructed that the feeding of the machine which involves the placing of the slabs or blocks in the chucks may be performed by a boy or other comparatively unskilled person, and without danger of accident to the feeder.

The invention consists in novel combinations of parts hereinafter described, and set forth in the claims.

In the accompanying drawings, Figure 1 is a front elevation of a machine embodying my invention; Fig. 2 is a detail sectional view, upon a larger scale, of a part of one of the chucks or holders. Fig. 3 is a vertical section of the machine in a plane through the center of a rotary disk or carrier on which are the chucks or holders and parallel with the axis thereof; and Fig. 4 is a vertical section on the plane of the dotted line *x x*, Fig. 3, looking toward the left.

Similar letters of reference designate corresponding parts in all the figures.

A designates the frame of the machine, which may be constructed in any suitable manner, and of cast-iron or other appropriate material.

B designates a shaft supported in bearings *a* in the frame, and having secured upon it a disk or carrier, B′, so that it will rotate with the shaft.

C designates spindles arranged in bearings *b* on opposite sides of the disk or carrier B′. These spindles are parallel with each other, but out of line, and at their inner ends, which are adjacent to the disk or carrier, they are provided with rotary cutters for turning buttons. The spindles are so supported in their bearings *b* that they may be moved longitudinally toward and from the disk or carrier B′, and they are rotated rapidly by belts C′, extending from a lower counter-shaft (not here shown) and passing over pulleys *b′* on the spindles. On the rotary disk or carrier B′ is a circular series of chucks or holders, and the disk or carrier and spindles C are so arranged with relation to each other that the spindles will be exactly in the circular path traversed by the chucks or holders as the disk or carrier is turned. These chucks or holders may be of any suitable construction which will enable them to grasp and hold slabs or blocks from which buttons are to be turned.

In the present example of my invention each chuck or holder consists of two annular jaws, *c d*, having serrated or roughened faces to grasp and hold a slab or block firmly. The jaws *c* are secured rigidly in circular seats or apertures in the disk or carrier B′ by means of set-screws *c′*, or otherwise, while the jaws *d* are placed at the ends of levers D, the construction of which is best shown in Fig. 2. The jaw *d* is formed upon the end of a stem or shank, *d′*, which is screwed into the lever D, and between the end of the lever and the jaw *d* is a roller, d^2, which turns freely on the stem or shank *d′*. The levers D of the several chucks or holders are fulcrumed at their inner ends to the side of the disk or carrier B′ by means of bolts *e*, and they stand radially to the disk or carrier, as shown best in Fig. 4. It is of course essential that the jaws *d* of the chucks should be concentric with the jaws *c*, and the screw-threaded shanks or stems *d′* of the jaws *d* provide for the adjustment of the jaws *d*. After being so adjusted, they may be secured by set-screws d^3, inserted in the levers D, as shown in Fig. 2. The construction and arrangement of the levers D enable them to swing toward or from the disk or carrier, so as to grip slabs or blocks between the jaws *c d*, or so as to release them therefrom. In order to maintain the jaws *d* in a closed position, I apply to each lever D a spring, *e′*, which is secured to the face of the disk or carrier, and bears on the set-screw d^3 or a pin projecting from the lever.

Now, although I have here shown fourteen

chucks or holders on the disk or carrier, I may employ three or more chucks or holders, and do not limit myself to any particular number.

Any suitable mechanism may be employed for imparting a step-by-step rotary motion to the disk or carrier B′.

As here shown, the shaft B has fixed upon it a ratchet or toothed wheel, B^2, and loosely mounted on the shaft is an arm or lever, B^3, which carries a sliding pawl or dog, e^2. This pawl or dog works in a slideway, e^3, and is impelled against the ratchet-wheel by a spring, e^4. (Shown in Fig. 3.) When the lever B^3 is moved in one direction—that is, in the direction indicated by the arrow in Fig. 4—the pawl will engage with the wheel and turn it and the disk or carrier B′ in the same direction. When the lever or arm B^3 is moved in a reverse direction, the pawl e^2 plays idly over the wheel B^2. The lower end of the lever or arm B^3 is connected with a sliding bar, B^4, fitting in a slideway, *f*, and said bar is moved or reciprocated by a cam, E, fixed on a main shaft, E′, and engaging alternately with lugs or projections *f*′ on the bar B^4. The main shaft E′ is rotated by a counter or driving shaft, F, carrying a worm or screw, *g*, which engages with a worm-wheel, *g*′, on the shaft E′. The main shaft E′ carries at its ends cams E^2, which, through levers E^3, impart the necessary longitudinal movements to the spindles C. The levers E^3 are fulcrumed at f^2, and their upper ends are connected with the spindles C, while their lower ends engage with the grooves of the cams E^2.

The spindles C are arranged one in advance of the other a distance equal to the distance between the chucks or holders, and the rotating mechanism of the disk or carrier B′ is so proportioned that the movement of the disk or carrier at each step is just sufficient to carry the chucks or carriers successively from one spindle C to the other; and the said mechanism is so timed that the disk or carrier comes to a state of rest after each movement, with its chucks or holders exactly opposite the spindles C. In order to hold the disk or carrier absolutely against movement while the cutters of the spindles C act, I employ a check or stop, which may consist of a spring, *h*, armed with a projection or tooth, *h*′, which is adapted to engage with the chuck-jaws *c*, as shown in Fig. 1. The spring *h* holds the tooth *h*′ in engagement with the disk or carrier B′, and before the latter can be advanced the tooth *h*′ must be disengaged from it. This I effect by means of a lever, G, fulcrumed at *i*, and one arm of which acts on the spring *h*, while the other arm is acted on by a cam, *i*′, on the main shaft E′. Just before the cam E acts to advance the disk or carrier B′, the cam *i*′ acts on the lever G, and, pushing back the spring *h*, withdraws the tooth from engagement with the disk or carrier. Just before the disk or carrier B′ stops, the cam *i*′ releases the lever G, and the tooth or projection *h*′ is then pressed with the full force of the spring *h* against the side of the disk or carrier. So soon, therefore, as the chuck-jaw comes opposite this tooth the latter flies into it under the impulse of the spring *h*, and so locks the disk or carrier B′. After the disk or carrier B′ is locked, as above described, the spindles C are advanced simultaneously, and the cutter of the upper spindle turns one side of the slab or block, while the cutter of the lower spindle simultaneously turns the other side of the slab or block previously operated upon by the cutter of the upper spindle, and also cuts out the button from the slab or block.

The attendant or feeder may stand at the side of the disk or carrier opposite the spindles C C, and as the chucks or holders reach him he removes the ring of material left by the cutting out of the button and inserts a fresh slab or block in the chuck or holder *c d*. The springs *e*′ act with sufficient pressure to prevent the slabs or blocks from dropping out of the chuck-jaws *c d*, but with insufficient force to hold the slabs or blocks while being operated by the cutters. To so hold the slabs or blocks, however, I employ a stationary cam, *j*, secured to an upright or standard, *j*′, and with which the rollers d^2 come in contact as the disk or carrier rotates. The standard *j*′ is thin, so as to yield slightly, and it forms a powerful spring for holding the jaw *d* against the slab or block to be operated on. As clearly shown in Fig. 4, the cam *j* is made in two parts, and the standard *j*′ is bifurcated, so as to enable either piece of the cam *j* to yield independently of the other. The slabs or blocks which are held in the chucks or holders will vary in thickness, and by making the cam *j* in two parts, capable of yielding independently of each other, the levers D will be acted on by one or the other of said parts, even if the thickness of slabs or blocks varies.

With this machine buttons can be turned out very rapidly, and the slabs or blocks may be placed in the chucks or holders by boys or unskilled persons without danger of accidents to the feeder.

Although my improved machine is more particularly intended for turning buttons, the invention or features thereof may be embodied in machines for turning other articles.

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

1. The combination, with a rotary disk or carrier provided with a circular series of chucks or holders, each consisting of a fixed jaw secured in or on the disk or carrier, and a lever fulcrumed to the disk or carrier and having an attached jaw, of the spindles C C, with their cutters, arranged and operated substantially as herein described.

2. The combination, with the rotary disk or carrier B′, of the circular series of chucks or holders, each consisting of a fixed jaw, *c*, a movable jaw, *d*, having an attached stem or

shank, and a lever, D, fulcrumed to the disk or carrier, and in which the stem or shank of the movable jaw is adjustably secured, substantially as herein described.

3. The combination, with a rotary disk or carrier, B′, provided with a circular series of chucks or holders, each consisting of two annular jaws, *c d*, one of which, *c*, is fixed in the disk or carrier, and the other of which, *d*, is carried by a lever, D, fulcrumed to said disk or carrier, and means for rotating said disk or carrier step by step, of the spindles C C, provided with cutters and arranged at opposite sides of the disk or carrier parallel with the axis thereof, and one in advance of the other, mechanism for operating said spindles, and a stationary cam or device which acts upon the levers D as the latter are brought opposite to it, and serves to tighten the clamp-jaw *d*, substantially as herein described.

4. The combination, with the rotary disk or carrier B′ and the annular jaws *c*, fixed therein, of the levers D, fulcrumed to said disk or carrier and having the movable jaws *d* attached to them, the springs *c′*, acting on said levers, and the cam *j* and its yielding support or holder *j′*, which acts upon said levers as they are carried past it, substantially as herein described.

5. The combination of the rotary disk or carrier B′, provided with a circular series of chucks or holders, each consisting of a fixed jaw, *c*, secured in the disk or carrier, and a lever, D, fulcrumed to the disk or carrier and having an attached jaw, *d*, the ratchet-wheel and lever B^2 B^3, for operating said disk or carrier, the sliding bar B^4, connected with said lever, and the cam E and shaft E′, for operating said ratchet-lever, substantially as herein described.

6. The combination, with the rotary disk or carrier B′, provided with a circular series of chucks or holders, each consisting of two annular jaws, *c d*, one of which, *c*, is fixed in the disk or carrier, and the other of which, *d*, is movable and carried by a lever, D, fulcrumed to said disk or carrier, and means for rotating the disk or carrier step by step, of the spindles C C, provided with cutters and arranged on opposite sides of the disk or carrier, one in advance of the other, mechanism for operating said spindles, and a locking device for locking said disk or carrier between its movements, substantially as herein described.

7. The combination of the shaft B and the disk or carrier B′, provided with a circular series of chucks, each consisting of two annular jaws, *c d*, one fixed in the disk or carrier and the other movable, the spindles C C, provided with cutters and arranged parallel with the shaft B, and one in advance of the other, on opposite sides of the disk or carrier, mechanism for operating said spindles, and for imparting a step-by-step rotation to the disk or carrier, the main shaft E′, the locking-spring *h*, and the lever G and cam *i′*, for retracting said locking-spring, substantially as described.

GEO. S. BEERS.

Witnesses:
H. S. MYGATT,
W. L. JENNINGS.