(No Model.) 2 Sheets—Sheet 1.

R. H. LINDSAY.

PEARL BUTTON MACHINE.

No. 553,500. Patented Jan. 21, 1896.

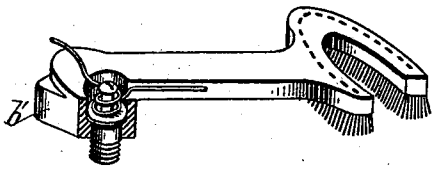


Fig. 2.

Fig. 1.

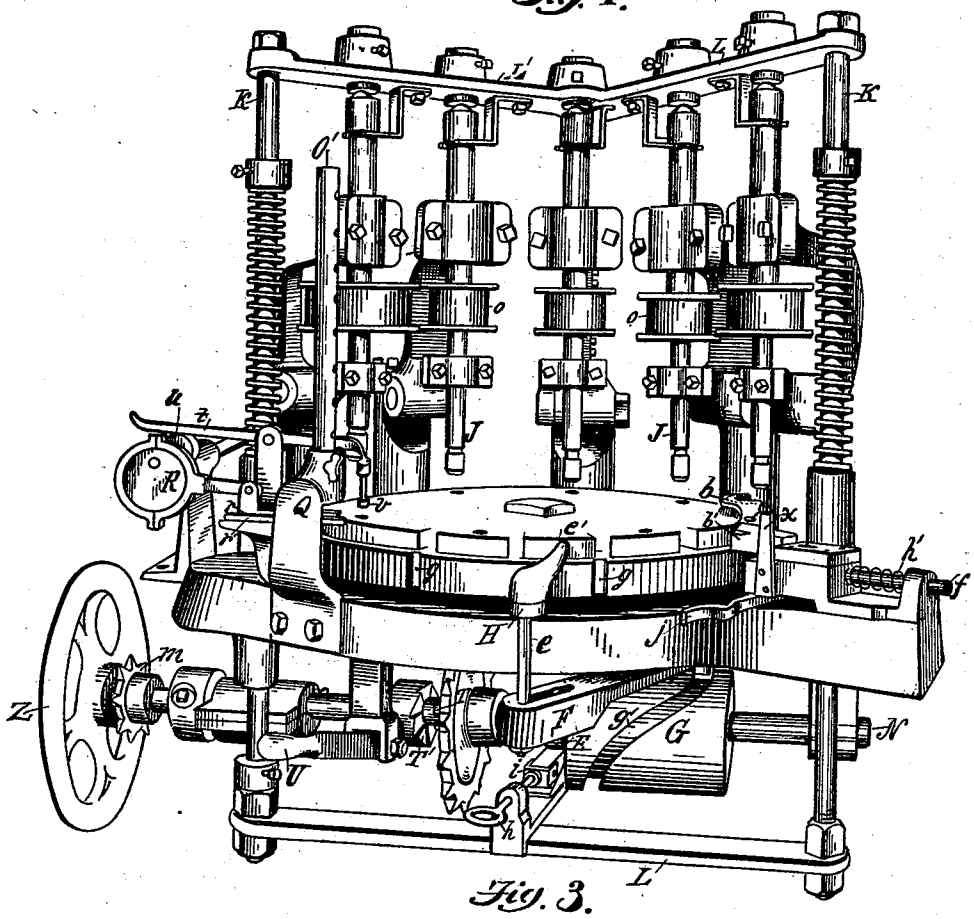
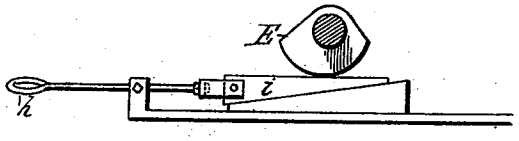


Fig. 3.



WITNESSES

Ignatius P. O'Brien

Henry Roache

INVENTOR

Robert H. Lindsay

By James O'Brien

Attorney.

(No Model.) 2 Sheets—Sheet 2.

R. H. LINDSAY.

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Fig. 5.

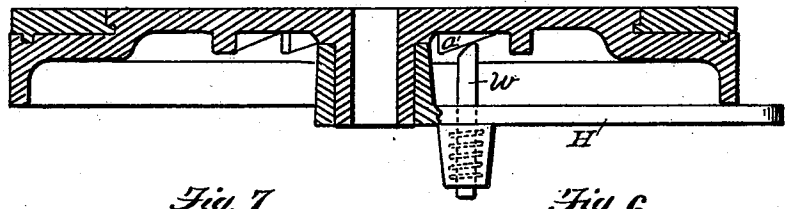


Fig. 7.

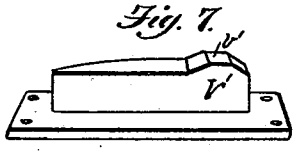


Fig. 6.

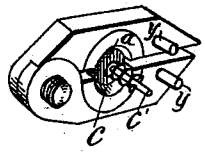


Fig. 8.

Fig. 4.

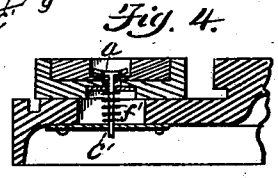
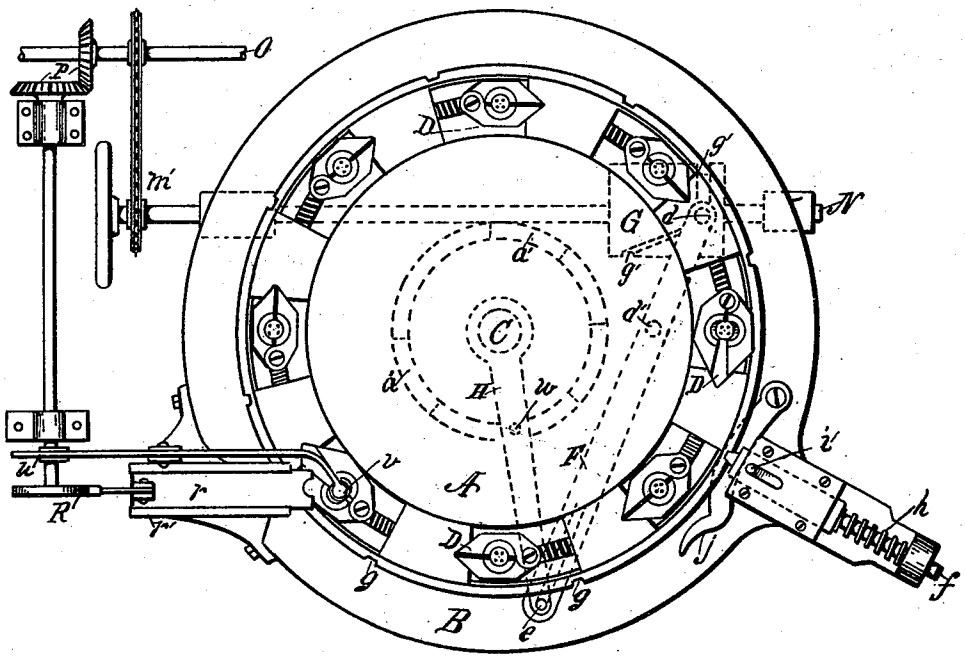


Fig. 2.



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By James O'Brien

Attorney.

UNITED STATES PATENT OFFICE.

ROBERT H. LINDSAY, OF DETROIT, MICHIGAN.

PEARL-BUTTON MACHINE.

SPECIFICATION forming part of Letters Patent No. 553,500, dated January 21, 1896.

Application filed June 25, 1894. Serial No. 515,681. (No model.)

To all whom it may concern:

Be it known that I, ROBERT H. LINDSAY, a citizen of the United States, and a resident of Detroit, in the county of Wayne and State of Michigan, have invented a new and useful Improvement in Pearl-Button Machines, of which the following is a specification.

My invention relates more especially to that class of machines having revolving tables provided with chucks for holding the blanks of unfinished buttons during the process of making.

Heretofore, as far as I am aware, an operator was required to give constant attention to one machine, it being necessary to put the blanks out of which the buttons were made in place by hand, while the drilling and other operations necessary to complete the button required the actual handling of some device constantly.

The object of my improvement is to render this constant personal attention unnecessary by the substitution of automatic devices that will place the blanks in their proper places in the chucks, drill the necessary holes, complete the making of the button and remove the same from the machine, securing thereby a large saving in time and labor. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of the machine. Fig. 2 is a plan or top view. Fig. 3 is a side view of cam and adjusting wedges, which regulate the reach of the drills. Fig. 4 is a section of a chuck, showing the free bottom and pin which lift the button for removal. Fig. 5 is a section of the revolving table, showing the lever and free pawl or sliding bolt which engages with the ratchet on the under side of said table. Fig. 6 is a view of the under side of a chuck, showing the pins that operate with the wedges on the stationary table to open the jaws of the chucks when about to receive a blank or release a button. Fig. 7 is a view of the wedge-shaped piece which opens a chuck when the button is about to be removed. Fig. 8 is a view of the wedge device which opens a chuck when a blank is about to be deposited in the same. Fig. 9 is an enlarged view of the brush which removes the button when finished, showing its operating parts.

Similar letters refer to similar parts throughout the several views.

A is a revolving table provided with any required number of chucks D, arranged at equal distances from each other in recesses around its circumference provided for such purpose, Fig. 2. These chucks are split longitudinally and the parts hinged at one end, so that a circular depression or bore at about the center of each, designed to receive and hold the blanks, can be enlarged by opening the jaws of the chuck for the reception of the blank and removal of the finished button. These operations are performed by wedge-shaped cams V V′, fixed on the bed-plate B underneath the chucks at the points required, passing between pins *y*, projecting downward, one from each jaw of a chuck, through slots in the underlying parts of the revolving table. The cam V′, which acts for the removal of the button, has an additional sub-cam *s′* on its top, which comes in contact with a pin *c′*, projecting downward from the center of a free bottom *a*, fitted in the bore *c* and resting on an annular bearing *s*, on which bottom the blank or button rests, it being a necessary support to prevent breakage in drilling. When the button is free by the opening of the chuck-jaws, it is pushed up above the plane of the chuck and table A, the free bottom being lifted by the contact of the sub-cam *s′* with the pin *c′*, and the button is then caught and swept off into a proper receptacle by the brush *b*. A small spiral spring *f′* around the pin *c′* (see Fig. 4) brings the free bottom back into place after the cam has passed. The brush *b* is operated by a spur *e′*, projecting from the head of the pin *e*, which connects the oscillating arms H and F. This spur is forced against a projecting cam *b′* at the pivoted end of the brush and compels it to sweep across the face of the chuck, carrying with it the button and dropping it over the side of the revolving table into a basket beneath.

The handle of the brush *b* is freely pivoted on top of the casing of the bolt *f* above the plane of the revolving table, and is held in place over the table by a spiral spring (see Fig. 9) coiled around a screw in a recess in the pivoted part, one end of the spring extending along the inside edge of the brush-

handle, the other end being fastened to the top of a post x, which also acts as a stop to the brush. The bolt f, which engages the revolving table in slots g to hold it rigid when the drills are at work, is secured in a casing on the stationary table B adjacent to where the finished button is brushed off. It is provided with a spiral spring h', which keeps its engaging end in contact with the edge of the revolving table. Underneath the casing of the bolt is a lever j, which is freely pivoted to the table B inside the line of the bolt, (see Fig. 2,) and passing beneath it is adapted to remain in contact with a pin i' which passes down from the bolt. This lever j is operated by the pin e that connects the oscillating levers F and H, which pin e on the return motion, when the revolving table is at rest, comes in contact with the free end of the lever j, which extends toward the front, and forcing it outward releases the bolt f from a slot g, allowing the revolving table to move forward.

The oscillating motion is communicated to the arm or lever F (which hangs underneath the bed-plate B, attached freely thereto by lugs and bolt d',) by the pin d, having a free sleeve at its end moving in a groove g' cut in the revolving cam G. This groove is V-shaped on one half the surface of the cam to communicate an oscillating motion. On the other half it is concentric to allow the arm F to remain stationary, so that the drills may have time to work safely. The arm or lever F is connected by a pin e to the radial arm H, which is sleeved around the central bearing C of the revolving table. The arm F is slotted at its outer end, so that the pin e may have free play to travel back and forth on the edge of the table A.

The tables A and B are about one inch apart. The radial arm H is designed to revolve the table A, which it accomplishes by a small rod w, which passes upward through the arm H, having a head which prevents it from going through. It is held in place by a small spiral spring pinned to it over the arm. This spring keeps the upper end of the rod in contact with a circular ratchet a', the edge of which is about an inch wide. The ratchet-teeth correspond in number with the chucks.

When the arms F and H commence to travel forward from the point where the connecting-pin e has operated the brush for the removal of the button and the release of the bolt f, the revolving table being then free, the rod w is resting against the vertical side of a tooth of the ratchet, and consequently as it moves forward it carries with it the revolving table one step, or the distance between the chucks. At this point the bolt f again shoots into a slot g in the edge of the revolving table, forced thereto by the spring h. The arms F and H, having reached their forward limit, then return, the rod w sliding over the inclined or long edge of the ratchet-tooth until it reaches the vertical part, when it is forced behind it, ready to repeat the operation. During this last operation, when the bolt f has secured the table, the drills J are brought into play by the action of the eccentric cam E forcing down the hanging frame L K L', to which they are attached. This frame is composed of three upright rods K, passing through bearings in the table B, two toward the front, one on each side, just back of the line of the feed device, and one in the rear, back of the center. They are connected rigidly at their upper ends by the bars L' L', to which the drills are attached by forked hangers, Fig. 1, and kept in place by standards secured to the table B, having adjustable arms with boxes in which the drills run. Spiral springs around the rods K above the bed-plate B allow the frame to be forced down by the cam E and draw it back into place. The lower ends of the rods K beneath the table are connected by the bars L, and made more rigid by a brace k from the center of the front bar to the rear rod. On this brace under the eccentric cam E are a pair of wedges i, one fixed, the other adjustable by means of a handle h extending toward the front and passing through a bearing, where it may be fastened at any desired position, the object of the wedges being to limit the depth of the drilling.

M is a driving-shaft which transmits motion to the shaft N of the machine by sprocket-wheels l m and connecting-chain. A like motion is transmitted to the shaft N by sprocket-wheel m' and to the blank-feed by the equal gear-wheels P. The drills J are run by an independent belt, passing alternately on each side of the pulleys o, attached to the drills, and thence to a driving-pulley.

O is a removable tube for blanks. When filled it is inserted in the holder Q and fastened by a thumb-screw. r is a slide-plate working underneath the blank tube by the eccentric R on the shaft S. When the sliding plate r, which has a semicircular incut end, is drawn back to its limit by the action of the eccentric R, a blank is allowed to drop on the underlying guide-plate, which blank is then carried forward by the sliding plate (the guide-plate overlapping the revolving table) and placed in its empty recess in the chuck, which has just arrived at that point. The lever t is then acted upon by the eccentric cam u on shaft S, when the plunger v at the end of the lever comes down on the blank and presses it securely in place. At this same time the cam E is forcing the drills to work. On the drawing back of the sliding plate for another blank the drills are also withdrawn, and the revolving table set free is again brought forward for another step.

T is a free clutch-wheel. T' is its interlocking part feathered to the shaft and operated by the lever U, secured to the bed-plate B by lugs. Z is a hand-wheel attached to shaft N for the purpose of bringing the machine to any desired position for the placing of or changing drills or other parts.

I am aware that a revolving table with chucks and drills working in conjunction with it is not new or original with me. Therefore I disclaim them, except in combination with the devices which make them automatic for the purpose designed.

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

1. A revolving table adapted to support a plurality of chucks, said table provided on its under side with a circular ratchet, a radial arm sleeved at its inner end to the central bearing on which said table revolves; means secured to said radial arm adapted to engage said circular ratchet; a lever having a slot in one end adapted to receive a pin secured to the outer end of said radial arm, in combination with a cylindrical cam having an irregular groove cut around it adapted to receive said pin, said groove being concentric on one half of said cylinder cam and running semi-longitudinally across and back in a V shape course on the other half for the purpose of securing a long dwell (three to one) during the drilling operation; all substantially as described and shown.

2. A revolving table adapted to support a plurality of chucks, said table provided on its under side with a circular ratchet; a radial arm sleeved at its inner end to the central bearing on which said table revolves; means secured to said radial arm adapted to engage said circular ratchet; a lever having a slot in one end adapted to receive a pin secured to the outer end of said radial arm; a cylindrical cam having an irregular groove cut around it, part V shape and part concentric to secure a dwell of at least three to one, all in combination with a locking device adapted to lock and release said revolving table intermittingly, operated by said oscillating lever and pin at the end of said radial arm; all substantially as described and for the purpose set forth.

3. In a button machine, the combination of a revolving table and button holding chucks mounted on said table, with means whereby the buttons or blanks are fed upon said table; a guide adapted to bring the blanks successively into a position to be engaged by a chuck, and the means whereby said blanks are forced to assume a horizontal position in said chucks, all substantially as described and for the purposes set forth.

4. In a button drilling machine, in combination with a reciprocating gang of drills, a series of chucks, means for feeding blanks thereto and means for ejecting blanks therefrom, and mechanism whereby said blanks are fed from one drill directly to the next in turn and held stationary during the drilling operation all substantially as described and shown.

5. In a button machine, in combination with the operating mechanism, a button-chuck supporting rotating table having an intermittent motion, a receptacle to hold the blanks in position above the plane of said table and dropped successively, a slide arranged to guide each blank so dropped into a chuck successively, a rocking lever having a finger at one end arranged to force the button into place within said chuck, all substantially as described and shown.

6. In a button machine; the combination of a supporting frame; the revolving table mounted thereon; button holding chucks mounted on said table; vertically movable button supports carried within the jaws of said chucks, whereby said buttons, after having been operated upon, are raised to a position to be brushed off above the surface of said table; means secured to said supporting frame adapted to operate said chucks and button-supports; vertical spindles above said table and in axial line with said chucks, said vertical spindles adapted to carry cutting tools at their lower ends; an auxiliary frame engaging the upper ends of said spindles and adapted to force said cutting tools into and out of engagement with said buttons or blanks; means for giving said table an intermittent motion whereby said chucks are successively brought into the vertical path of said cutting tools; a button or blank receptacle supported above said table; means for guiding the blanks successively into said chucks; means for forcing said buttons to a horizontal position; and means for operating a brush whereby the finished buttons when raised to a position above the surface of said table are swept therefrom all substantially as described and for the purposes set forth.

ROBERT H. LINDSAY.

Witnesses:
IGNATIUS P. O'BRIEN,
MARY O'BRIEN.