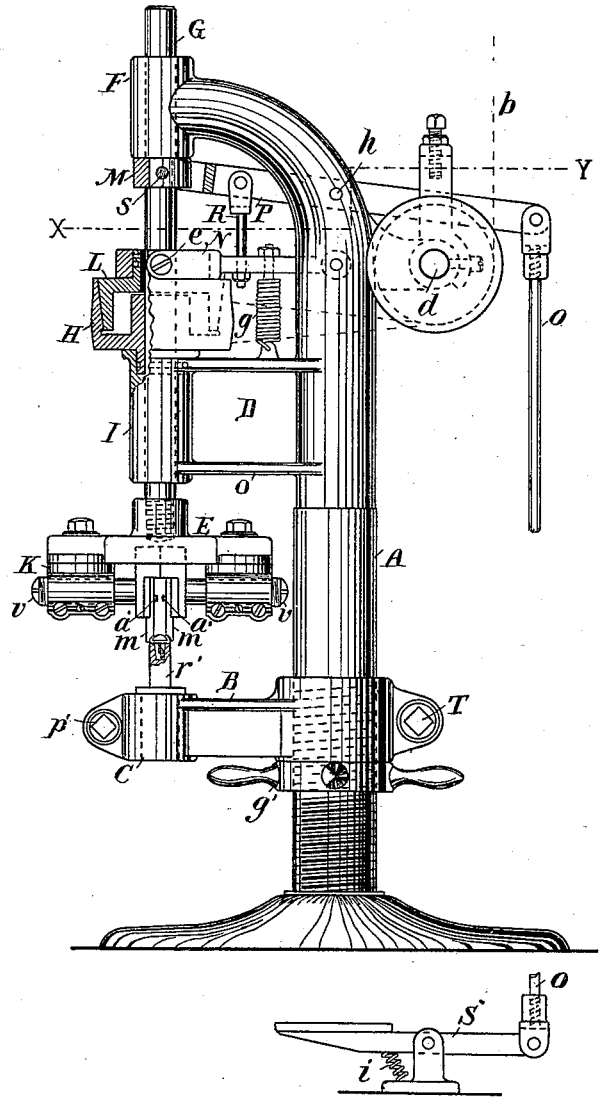
(No Model.) 2 Sheets—Sheet 1.

F. MOSSBERG.

MACHINE FOR CLOSING THE EDGES OF STUDS, &c.

No. 478,517. Patented July 5, 1892.

Fig. 1.



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(No Model.) 2 Sheets—Sheet 2.

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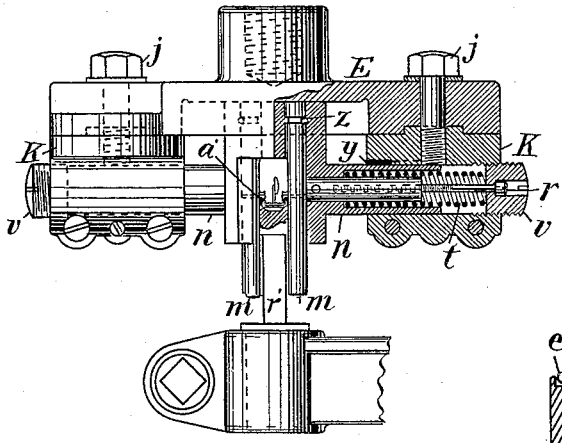
Fig. 2



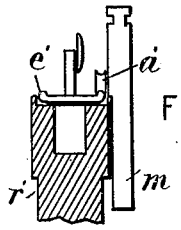


Fig. 6.

Fig. 3

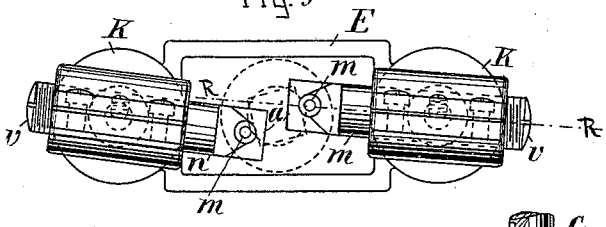


Fig. 4

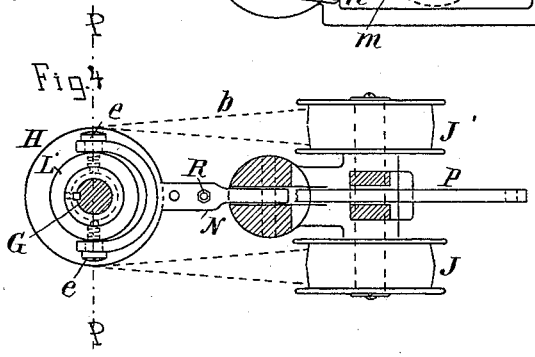
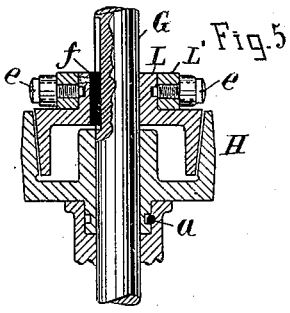


Fig. 5



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UNITED STATES PATENT OFFICE.

FRANK MOSSBERG, OF ATTLEBOROUGH, MASSACHUSETTS, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE MOSSBERG MANUFACTURING COMPANY, OF SAME PLACE.

MACHINE FOR CLOSING THE EDGES OF STUDS, &c.

SPECIFICATION forming part of Letters Patent No. 478,517, dated July 5, 1892.

Application filed April 27, 1891. Serial No. 390,565. (No model.)

To all whom it may concern:

Be it known that I, FRANK MOSSBERG, of Attleborough, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Machines for Closing the Edges of Studs, &c.; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to that class of machines used to turn over the edges of studs, collar-buttons, and like articles, and is intended to facilitate the operation and obviate the difficulties in case such articles have irregularly-shaped outlines, and also to avoid breakage in cases where stones or pearl faces are to be secured in the buttons, which breakage is the cause of a considerable loss when the closing or turning is done in the usual way with dies and presses.

Figure 1 is a side elevation of the machine. Fig. 2 is an enlarged side view of the chuck or revolving head, a part being drawn in section to show the internal construction. Fig. 3 shows the under side of the chuck represented in Fig. 2. Fig. 4 is a horizontal section of the machine, taken on lines Y, Fig. 1, looking downward. Fig. 5 is a view in section of the friction-clutch, with a portion of the arbor in elevation, on line P, Fig. 4. Fig. 6 represents the pin *m* and roll *a'*, with a part of a stud in section to show the edge turned over by the roll and a part of the mandrel.

This machine, which is of the nature of a press and lathe combined, consists of an upright standard A, supported by a base broad enough to give it firmness and is carried over at the top in the form of half an arch provided at the top with a bearing E to hold a vertical arbor or spindle G. An adjustable arm B is arranged to slide up and down on the lower part of the standard A, the outer end having a vertical bearing C made in it in line with the bearing in the top of the standard. Another fixed arm D is made on the standard A a short distance above its middle, which extends out under the arched top and carries a vertical bearing I, having an opening through it agreeing with the opening in the bearings in the arm B and the top of the standard. The upright arbor G is fitted to revolve and slide freely in the bearings.

The arrangement of mechanism for rotating the arbor G consists of a pulley H, held free to turn on the top of the bearing I by a hub on the under side of the pulley, that projects down into a recess made in the upper side of the bearing and is held there by a pin *a*, passing through the bearing and an annular groove in the hub of the pulley. This pulley H is driven by a belt *b*, that comes down from a pulley on a driving-shaft overhead and passes under an idler-pulley J, held loosely on a stud *d*, fast in an arm on the back of the standard A, and after making a quarter-twist turns and passes around the pulley H back in like manner under another idler-pulley J', held on the other end of the stud *d*, and then up back to the driving-shaft again. (See Fig. 4.) This pulley H turns the arbor G by means of a friction-clutch, one part of which consists of a conical-shaped chamber made in the upper side of the pulley and the other part L of a cone-shaped collar made to fit into the cavity in the pulley, forming a well-known friction-clutch. The collar L is made to slide freely on the arbor G, but has a key or spline *f* made fast in its hole, which spline slides easily in a short slot made in the arbor G, Fig. 5. The collar L is held in the forked arms of the lever N by means of screw-studs *e*, passing through the ends of the arms and screwing into the ring L'. The lever N is pivoted at its other end to the standard A, and a close spiral spring *g* has its upper end made fast to the lever N by means of an adjustable screw and nut and its lower end attached to the arm that supports the pulley H. The object of this spring is to draw the parts of the clutch together to turn the arbor whenever the collar L is not held up to stop it. The arbor G is controlled in its vertical movements by means of a lever P, which is held in the standard A on a pivot *h*, passing through the lever and standard, and is connected to the arbor G by a coupling-collar M, which fits

into a recess turned in the arbor, the ends of the recess forming shoulders at each side of the coupling, which is fastened to the lever P by means of the studs S. The other end of the lever P is connected by a rod O to one end of a treadle-lever S′, held in a standard secured to the floor, and an open spiral spring *i* is placed under the other end of the lever S′ to hold that end up when not pressed down by the foot. The chuck carrying the turning-rolls consists of a bar or plate E, secured in a horizontal position to the lower end of the arbor G (see Figs. 2 and 3) and having blocks K K, which are alike throughout in their construction, secured to the under side at each end by means of bolts *j j*, upon which the blocks may be turned and set at any angle to the center of the arbor, and when set may be held in position by screwing up on the bolts *j*. The internal construction of the blocks K may be seen in Fig. 2, in which one of them is shown in section. Each block has a piston *n*, which is fitted to slide easily in an opening through the block and is recessed in at its back end to form a chamber to receive an open spiral spring *t* to press the piston toward the mandrel *r′* and leave a shell outside of this chamber to fill the hole in the block K, and also a central core to receive a screw *r* for the purpose of controlling the motion of the piston toward the mandrel, which it does by passing through a bushing *v*, screwed in the outer end of the hole in the block K, the hole in this bushing being made for a short distance from its inner end of the same size as the screw *r* under the head, and the rest of the hole is bored large enough to admit the head of the screw to pass freely back and forth. By turning the screw *r* or bushing *v* in or out the distance that the spring may press the piston in toward the center is lengthened or shortened, as may be desired. The piston is prevented from turning around in the block K by a spline *y*, fast in the block, fitting into a groove in the top of the piston. The inner end of each piston has a head, in the upper part of which a pin *m* is fitted to turn, and is held in by a pin *z*, passing through the block and fitting into a groove in the pin *m*. A small roll *a′* is held on a pivot fast in one side of the pin *m*, about midway of its length, or nearly opposite the center of the piston, having a concaved face the counterpart of the rim to be made on the button *e*. (See Fig. 6.)

A bearing-mandrel *r′* is held firmly in the center of the bearing C on the arm B, which projects up into the chuck and has a head of the size and shape of the head of the stud or button to be turned, and the lower parts of the pins *m*, which bear against the sides of the head of the mandrel *r′*, have the surface made flat on that side to rest against the head of the mandrel to prevent their turning away, and if the contour of the button is irregular the projections on the head of the mandrel have to push the piston *n* back against the pressure of the spring *t* as the chuck revolves around the button and mandrel, following the ins and outs of the irregular shape of the head of the mandrel. The head of the mandrel *r′* is recessed in on top to receive the particular shape of button to be rolled, each shape requiring its own mandrel, and when the stud or button is to be rolled on its face to retain a stone or piece of pearl a hollow is made in the end of the mandrel to receive the shank of the stud, which in that case would have to be turned downward during the rolling.

The lever P and the lever N are connected together by a rod R, which has a nut on its lower end to draw the lever up by; but the spring *g* is depended upon to draw it down.

The operation is as follows: The position of the arbor G is up, as seen in Fig. 1, when the machine is not in operation, and the lower ends of the pins *m* extend a little way onto the mandrel *r′*, which holds them open. The blank plate to be turned over, first having its edge turned up square around its sides, is inserted in the recess on the head of the mandrel and the stud placed in it. Then by pressing the front end of lever S′ down with the foot the back end will raise, by means of the rod O, the outer end of the lever P and move the inner end down, carrying the arbor G and the chuck. At the same time the lever N will be allowed to move down, being drawn by the spring *g*, so as to press the collar L into the pulley H, which, being revolved by the belt *b*, gives motion to the arbor G by the friction of the collar L in the pulley H. The continued motion downward of arbor moves the chuck down until the rolls *a′* come in contact with the upturned edge of the plate *e*, Fig. 6, when the concave face of the rolls will turn the edge over and roll it down on the back of the stud-head. Then by removing the foot from the treadle the spring *i* will throw it up and draw down on the end of the lever P and raise its inner end with the arbor G and the chuck. At the same time the lever P will draw up the lever N by the rod R and raise the collar L out of the pulley H, so that it will cease to drive the arbor. The finished stud can be removed and another plate and stud put in and the process repeated. The pins *m* are allowed to turn but slightly to let the rolls *a′* on them change their direction sufficiently to follow the shape of the edge of the plate to be turned over.

The mandrels *r′* that hold the studs may be changed by loosening the bolt T on the back end of the arm B and letting the arm drop by turning down the screw-collar *g′* until the head of the mandrel *r′* is clear of the pins *m*, when the arm B may be swung one side and the mandrel *r′* removed by loosening the bolt *p′* and another inserted in its place and the parts put back, as before. The pins *m* are pressed in against the head of the mandrel by the spring *t* and out by the projections on the head, which, as stated, is of the same

shape as the stud to be turned. This motion of the piston and the slight motion of the pins in their sockets when combined with the means to change the direction by swinging the blocks K on the chuck-plate makes it possible to follow the contour of almost any button or stud that may be desired, and when a stone or piece of pearl is to be inserted in the face of a stud or button the stud is put in the mandrel with its face up and the stone placed in its upturned edges, which by the process described will be rolled down over the edge of the stone by a gentle rolling pressure that will not be liable to break or otherwise injure the stone. By setting the blocks K so that the center of the pistons will be directed to one side of the center of the chuck, as shown in Fig. 3, oblong or forms more or less angular can be operated upon. Otherwise only round and broad ovals can be turned.

Having thus described my improvements, I claim as my invention—

1. The combination of the standard A, supporting the operating parts, an arbor G, held in bearings on arms attached to said standard, a pulley H, held loosely on the arbor G, a collar L, sliding with spline on the arbor G, a collar M, held loosely in a recess in the arbor G, a lever P, pivoted to the standard A and connected with the collar M, a lever N, pivoted to standard A and connected with the lever P by a rod R, the rod R, and a chuck-plate E, fast on the arbor G and carrying the devices for closing the edges of the studs, substantially as described.

2. In a machine for closing the edges of studs and like articles, the combination of the arbor G, plate E, fast thereon and having the blocks K adjustably secured thereto, pistons *n*, sliding in said blocks, and pins *m*, carried by said pistons and having rolls *a'* attached to them, substantially as and for the purpose specified.

3. A chuck for rolling over the edges of studs and like articles, consisting of a plate E, having blocks K adjustably secured thereto and capable of being set at an angle to the radius of said chuck, and pistons sliding radially in said blocks, with springs to press the pistons in toward the center, and pins *m*, having a limited rotary motion, held in said block, with small turning-rolls pivoted on the sides of said pins, and devices, substantially as described, to limit the motion of said pistons, substantially as herein set forth.

4. A chuck for rolling over the edges of studs and like articles, consisting of a plate having blocks adjustably secured thereto and pistons sliding in said blocks, carrying rolls having a short lateral motion, substantially as herein set forth.

5. In a machine for closing the edges of studs and like articles, a mandrel to hold the stud, having a head with the same contour as the shape of the head of the stud to be closed and recessed in its end to hold a stud or like article, said mandrel being held stationary in an arm on standard A, in combination with rolls having an axial motion to and from the mandrel and a short freedom of motion laterally, substantially as and for the purpose set forth.

6. In a machine for closing the edges of studs and like articles by means of rolls, a mandrel to hold the stud, having a head with the same contour at its periphery as the head of the stud to be closed, said mandrel being held stationary in an arm on the standard A, in combination with rolls for closing the edges, held on studs in carriages sliding to and from the mandrel in supports adjustably secured to the chuck E, said studs having a bearing against the guiding-head of the mandrel to control the radial movements of the carriages, according to the shape of the head of the stud-button operated on, substantially as set forth.

FRANK MOSSBERG.

Witnesses:
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BENJ. ARNOLD.