No. 624,216. Patented May 2, 1899.

C. P. JOHNSON.

BUTTON DRILLING MACHINE.

(Application filed Feb. 1, 1899.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

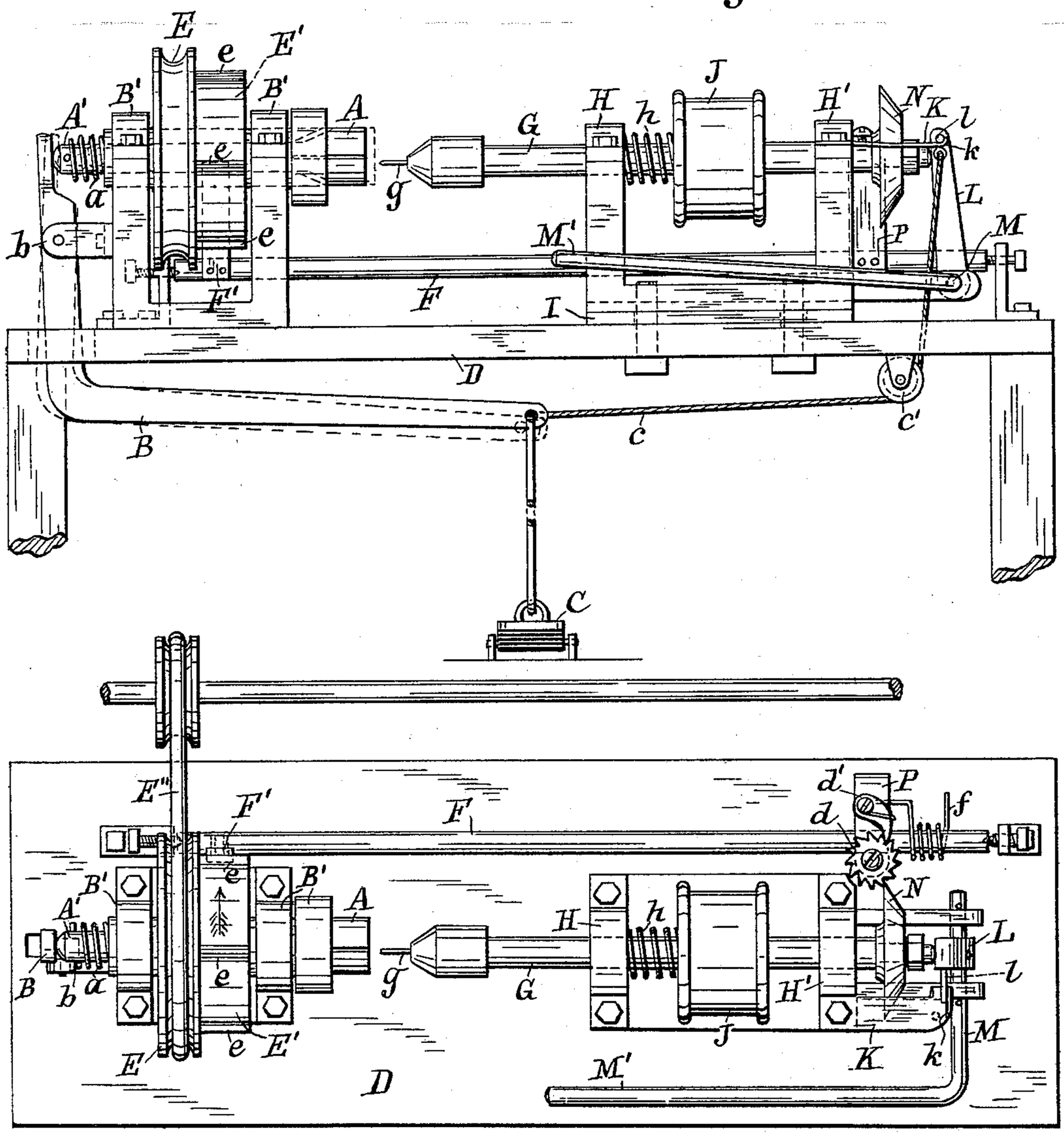

Fig. 2.

Witnesses.
N. M. Newton
H. M. Seamans

Inventor.
Chester P. Johnson
By Mark W. Dewey
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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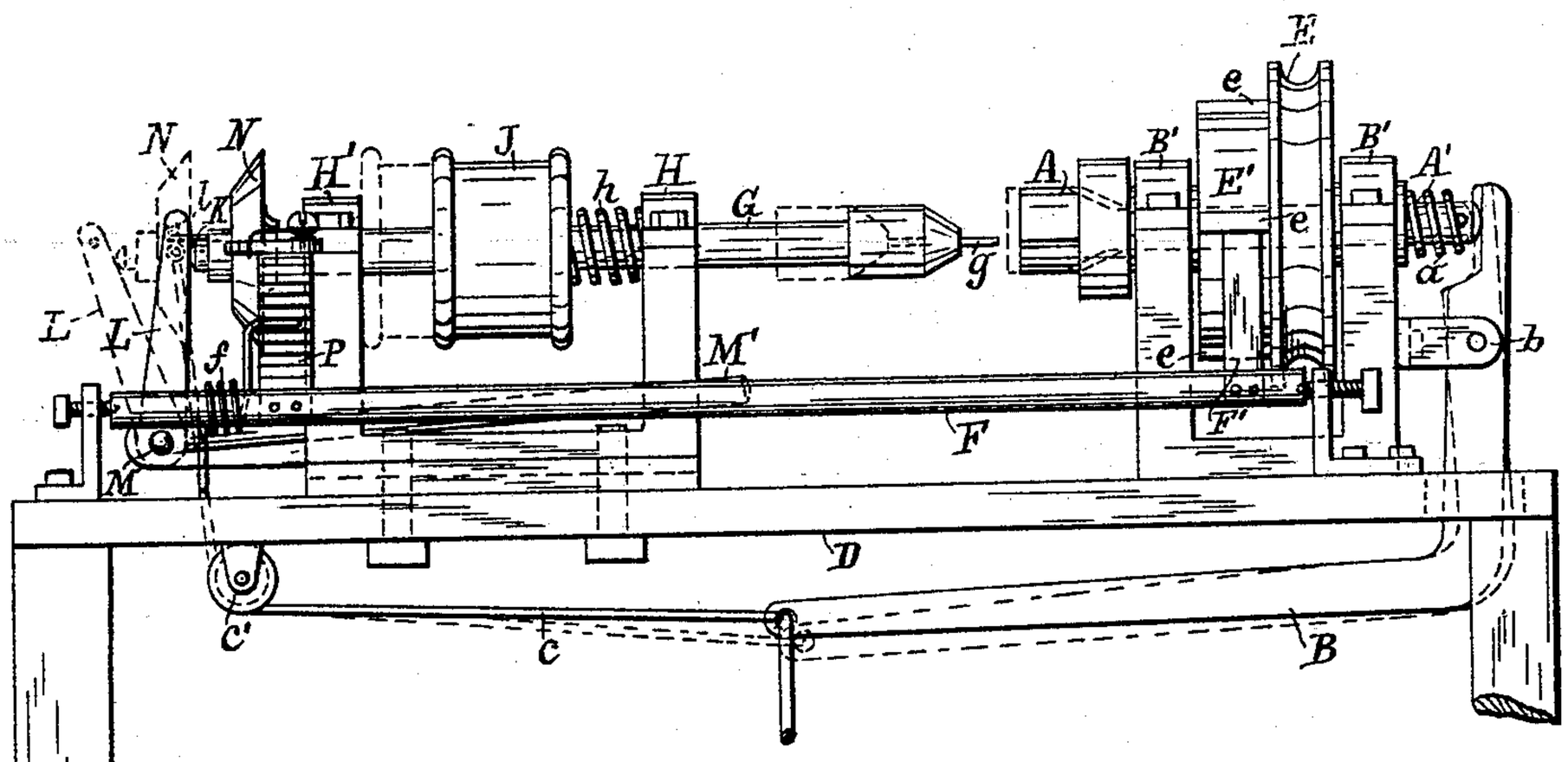

Fig. 3.

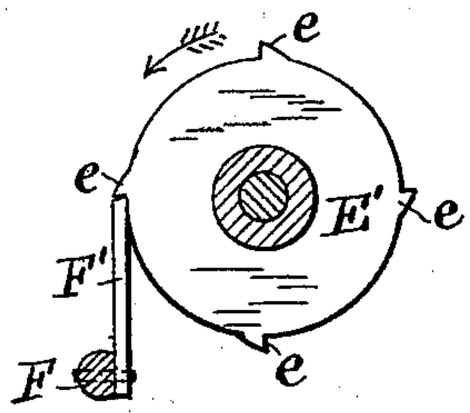

Fig. 4

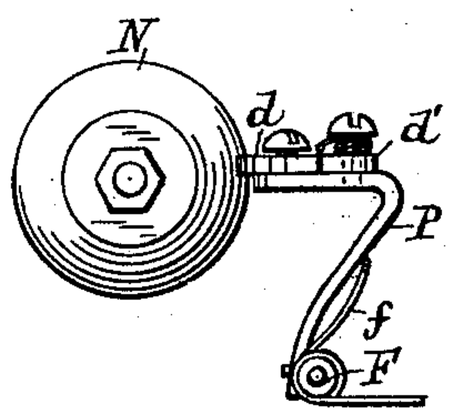

Fig. 5.

Witnesses.

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UNITED STATES PATENT OFFICE.

CHESTER P. JOHNSON, OF AMSTERDAM, NEW YORK, ASSIGNOR OF TWO-THIRDS TO WILLIAM G. WALDRON AND JOHN L. VOORHEES, OF SAME PLACE.

BUTTON-DRILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 624,216, dated May 2, 1899.

Application filed February 1, 1899. Serial No. 704,151. (No model.)

To all whom it may concern:

Be it known that I, CHESTER P. JOHNSON, of Amsterdam, in the county of Montgomery, in the State of New York, have invented new and useful Improvements in Button-Drilling Machines, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to button-drilling machines; and the object is to provide a simple machine of this class that will operate on a single button, drill each hole therein separately, accurately place the holes so that there will be even spaces between them, revolve the head carrying the button only in one direction and by power, and to limit the reciprocating action of the drill-spindle to save time and also to save the button from injury.

I am able with my improved machine, although operating on a single button at a time, to accomplish more work or drill more buttons in a given length of time than is accomplished with the well-known automatic machines operating on several buttons at once, and this with a greater degree of accuracy and less skill.

My machine is not only adapted for drilling fine buttons, but is also adapted to drill cheap fragile buttons differing in hardness and thickness, and this without injuring them or punching the center out when the drill strikes them. This is due to the limited longitudinal movement of the drill-spindle between the drilling of the holes. In the old machines the range of movement is so great—that is, the drill is moved so far from the button—that great rapidity of movement is necessary, which results often in the drill striking the button suddenly and breaking the same or the drill. This is all overcome in my machine by a limiting catch or stop. Another great disadvantage with the old machines has been overcome—namely, the unequal spacing between the holes—and as the buttons are often sewed on by a machine this resulted in the breaking of many needles and buttons and caused much loss of time.

To this end my invention consists in certain combinations of parts hereinafter described, and specifically set forth in the claims.

In the drawings hereto annexed and forming a part of this specification, Figure 1 is a front side elevation of my improved drilling-machine. Fig. 2 is a top plan view of the same. Fig. 3 is a rear side elevation. Fig. 4 is a detail view of the toothed wheel and stop for spacing the holes in the button, and Fig. 5 shows an end view of the pawl and ratchet for removing the said stop to permit the toothed wheel to revolve in the direction of the arrow one-fourth of a revolution by means of the belt.

Referring specifically to the drawings, A is the chuck for holding the button, which is of the usual and well-known form of construction and is mounted on a reciprocating spindle A′, which is acted upon by a coiled spring *a* to contract the chuck and hold the button.

B is a bent lever which is fulcrumed intermediate its length upon a projection *b* on one of the standards of the bearings of the said spindle. The upper end of the lever B engages the end of the spindle A′ and is adapted to move the same longitudinally against the action of the spring when the opposite end of the lever B is depressed by the treadle C, attached to the same, to allow the button-chuck to expand and release the button as usual.

B′ are the bearings for the spindle. The bearings are on the upper ends of standards joined together and mounted on a table D. Between the bearings on the spindle is a driving-pulley E for the spindle, and secured to one side of the same is a disk E′, having four teeth *e*, equally spaced apart thereon, to engage the stop F′, mounted on the oscillating rod F. Heretofore in order to revolve the button between each drilling operation, or between the drilling of any two holes, the spindle A′ was turned by hand in one direction and then in the other, or toward the stop F′, and this was the cause of the unequally-spaced holes, for as the machine was operated automatically in its other operations and very rapidly and as the turning of the spindle A′ in two directions—backward and forward—to meet the stop F′ occupied considerable time it often resulted in the drill striking the button and drilling a hole before the tooth had reached the stop, and this caused a misplaced hole, which presented a bad appearance and

caused the breaking of the machine-needles when attempting to sew the buttons on. With my improved machine the spindle A′ is turned intermittently only in one direction and by power, and the stop is removed from the disk to permit the quarter-revolution of the pulley, disk, and spindle or to allow one tooth to pass and is returned to the periphery of the disk in time to catch the next tooth, and this is effected by certain simple means hereinafter described.

On a line parallel with the axis of the spindle A′, but somewhat lower and to one side, is the axis of the drill-spindle G. The latter spindle is also reciprocal in its action, is provided with a chuck and drill *g* on one end, is mounted in bearings H and H′ on standards joined together and adjustably mounted on the table by means of the well-known wedge-plate I, the latter allowing the drill to be moved toward and from the center of the button, and is provided with a coiled spring *h*, between the bearing H and the pulley J, to force the drill away out of and from the button between the drilling operations. The spindle may be moved by the spring *h* to the right until the pulley J strikes the bearing H′, and this is done when the drilling of a button is completed for the purpose of allowing it to drop out of its chuck and to give room for the insertion of another blank, which is usually inserted by hand; but between the drilling of two holes in a single button the drill is only moved to the right a short distance, or to the position shown in Figs. 1 and 2, thus saving time. The longitudinal movement of the drill-spindle to the right is limited by a catch *k*, turned up on the end of a spring-plate K. This catch engages a pin *l* on the side of a lever L, which bears on the end of the drill-spindle. The lower end of the lever L is provided with a shaft M, which oscillates in bearings mounted on the standard H′ and terminates at the end nearest the operator in a handle M′. By depressing the end of this handle the drill-spindle is moved toward the button and a hole is drilled. Upon releasing the handle the spring *h* forces the drill-spindle away from the button. The spring-plate K, carrying the catch, is connected to the end of the lever B by a cord or cable *c*, which passes over a small pulley *c*′ below the table, so that when a button is completely drilled and when it is released by depressing the treadle the spring-plate will be drawn down and the catch *k* removed from the pin, thus allowing the spring *h* to carry the spindle to the right the distance between the pulley and the standard H′ and giving sufficient room for the insertion of another button-blank. The spindle G is carried to the left toward the blank by depressing the handle M′. This depression of the handle causes the wheel N with the sharp periphery, and preferably loosely mounted on the spindle, to turn the small ratchet-wheel *d* the distance of one tooth, and when the spindle, with the wheel N, is moved to the right by the spring *h* the arm P, carrying the wheel *d* and rigidly secured by its lower end to the oscillating rod F, is thrown back, and the rod F is oscillated to remove the detent or stop F′ from the tooth to permit the tooth to pass. As the detent is only momentarily removed, only a single tooth is permitted to pass, and the detent catches the next tooth *e*, thus holding the pulley against rotation, although the belt E″ may be constantly moving. The dog *d*′ prevents a back action of the ratchet-wheel, and the coil-spring *f* on the rod F presses the ratchet-wheel toward the wheel N and the detent F′ toward the disk E′.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a button-drilling machine, the combination with the reciprocating drill-spindle, of the rotary reciprocating spindle carrying the chuck to hold the button, the axes of the two spindles being parallel with each other, a pulley on the button-holding spindle to turn the latter, a disk secured to the button-spindle provided with teeth equally spaced apart, a detent to engage the teeth to hold the spindle from turning, an oscillating rod secured to the detent an arm projecting from the said rod, a ratchet-wheel on the arm, and suitable means on the drill-spindle to rotate the ratchet-wheel and oscillate the rod, as and for the purpose described.

2. In a button-drilling machine, the combination with the reciprocating rotary drill-spindle, of the rotary spindle carrying the chuck to hold the button, a pulley on the latter spindle to turn the same intermittently in one direction only, teeth evenly spaced apart on one side of the pulley, a detent to engage the teeth and to hold the pulley and spindle from turning, a horizontal oscillating rod carrying the said detent and extending alongside of both spindles, and means carried by said rod and drill-spindle to oscillate the rod when the drill-spindle is reciprocated, substantially as shown and described.

3. In a button-drilling machine, the combination with the rotary reciprocating drill-spindle and the rotary reciprocating button-holding spindle, a pulley on the latter spindle to rotate the same, a disk having teeth thereon evenly spaced apart, a spring to force the spindle longitudinally in one direction to contract the button-chuck, a lever bearing upon one end of the spindle to reciprocate the same to allow the chuck to expand, a detent on an oscillating rod to engage the teeth, a spring on the drill-spindle to move the drill from the button, means carried by the drill-spindle to oscillate the rod when the latter spindle is reciprocated, a lever bearing upon one end of the drill-spindle and having a handle connected therewith to operate the same, a pin projecting from one side of the lever, a spring having a catch thereon to engage the pin to limit the movement of the lever and spindle, and a connection between the said spring and

the lever engaging the other spindle to remove the catch when the said lever reciprocates the button-spindle, substantially as described.

4. In a button-drilling machine, the combination with the rotary reciprocating drill-spindle and the rotary reciprocating button-holding spindle, a pulley on the latter spindle to rotate the same, a disk having teeth thereon evenly spaced apart, a spring to force the spindle longitudinally in one direction to contract the button-chuck, a lever bearing upon one end of the spindle to reciprocate the same to allow the chuck to expand, a detent on an oscillating rod to engage the teeth, a spring on the drill-spindle to move the drill from the button, means carried by the drill-spindle to oscillate the rod when the latter spindle is reciprocated, a lever bearing upon one end of the drill-spindle and having a handle connected therewith to operate the same, a pin projecting from one side of the lever, a flat spring having a stop turned on its free end to engage the pin, and means to remove the stop to permit the spindle to move the drill farther from the button-chuck, substantially as described and shown.

5. In a button-drilling machine, the combination with the reciprocating drill-spindle and the rotary button-spindle, the spring for moving the drill-spindle longitudinally in one direction, and means for moving the spindle against the action of the said spring, a loosely-mounted wheel on the drill-spindle, an oscillating rod carrying a detent to engage teeth to limit the rotation of the button-spindle, an arm on the oscillating rod carrying a ratchet-wheel to engage the said loose wheel, a detent on the said arm to prevent back action of the ratchet-wheel, and a spring on the oscillating rod to oscillate the rod to move the ratchet-wheel toward the loosely-mounted wheel, as and for the purpose described.

In testimony whereof I have hereunto signed my name.

CHESTER P. JOHNSON.

Witnesses:

H. M. SEAMANS,

N. M. NEWTON.