

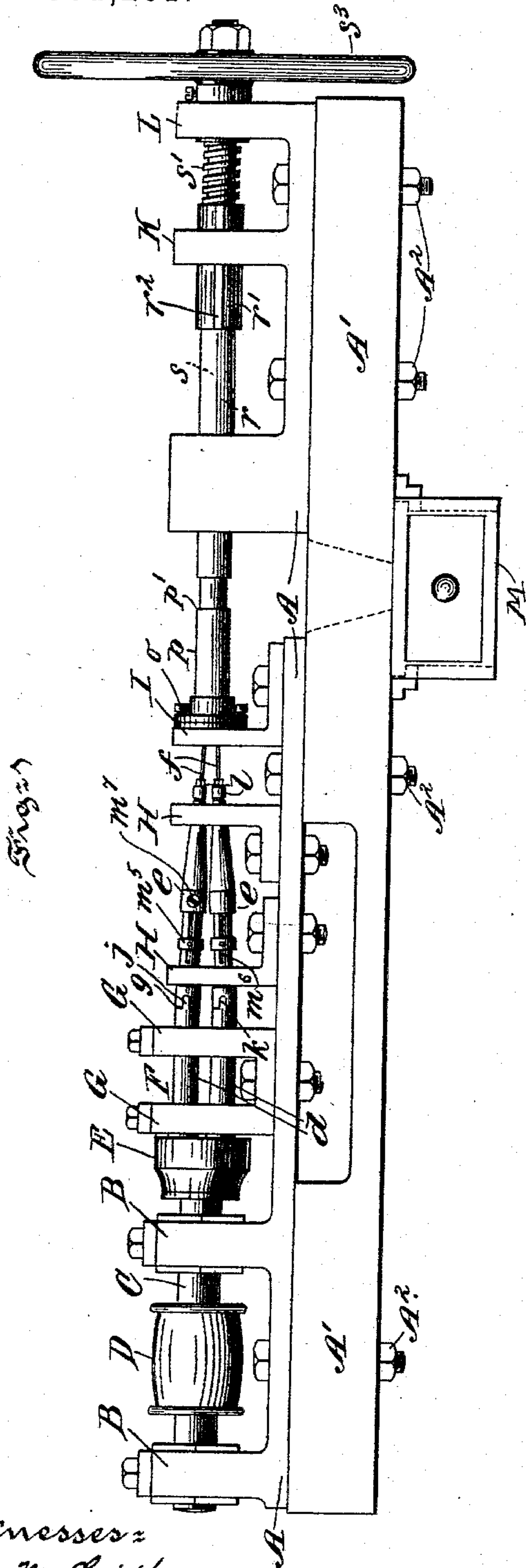
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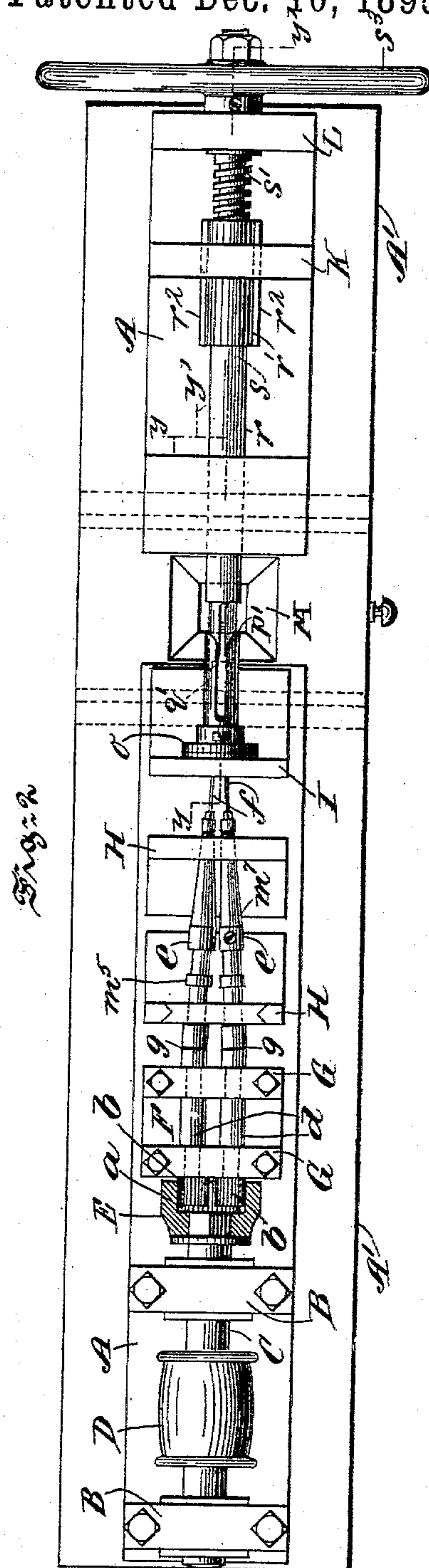
M. CHERNIC.
BUTTON DRILLING MACHINE.

No. 551,261.

Patented Dec. 10, 1895.



Witnesses:
Thomas M. Smith,
Richard C. Maxwell.



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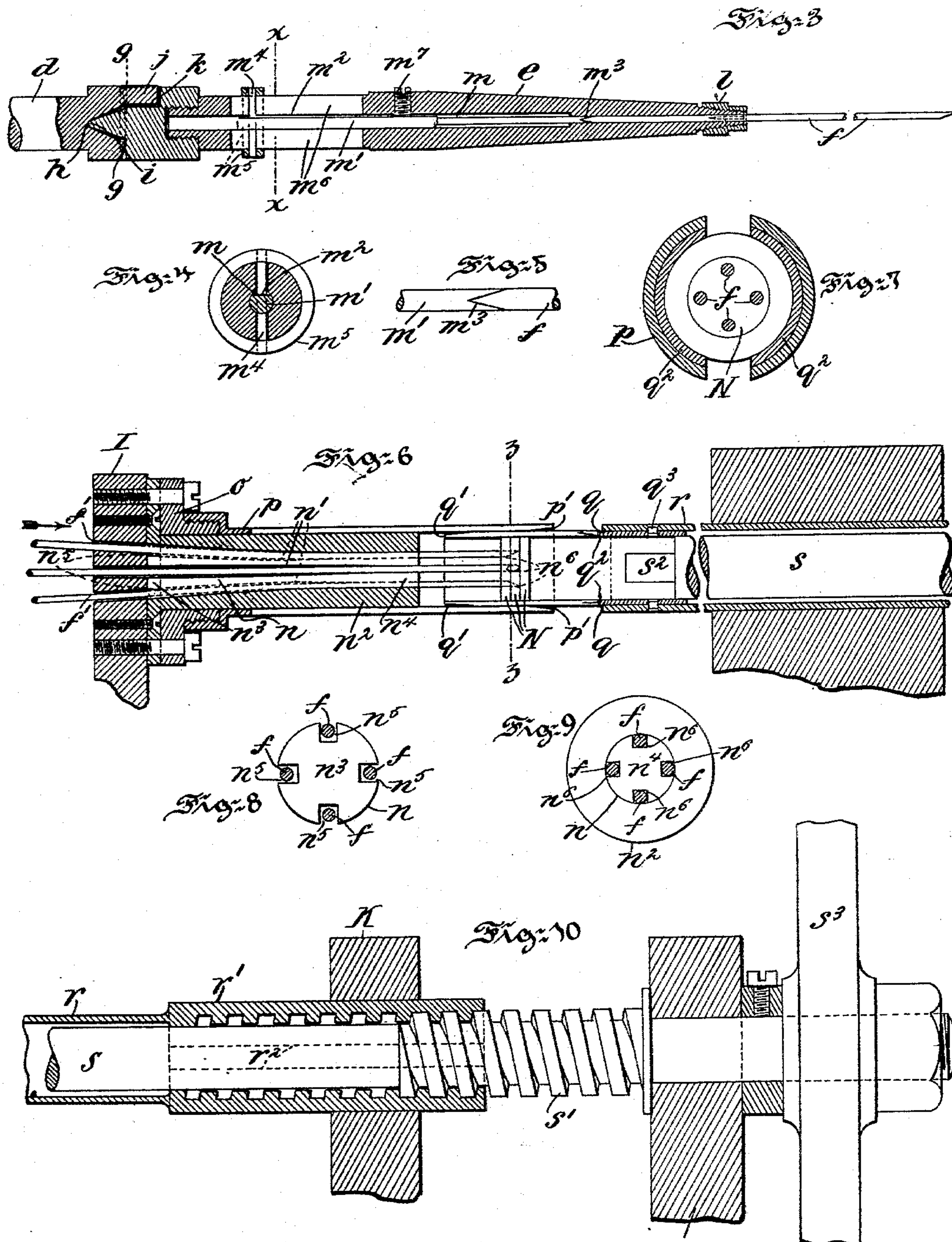
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UNITED STATES PATENT OFFICE.

MARCUS CHERNIC, OF PHILADELPHIA, PENNSYLVANIA.

BUTTON-DRILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 551,261, dated December 10, 1895.

Application filed April 4, 1895. Serial No. 544,364. (No model.)

To all whom it may concern:

Be it known that I, MARCUS CHERNIC, a subject of the Czar of Russia, but now residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Button-Drilling Machines, of which the following is a specification.

My invention has relation to a button-drilling machine of the class known as "multiple" drills in which a button-blank is simultaneously pierced by two or more drills; and in such connection it relates more particularly to the general construction and arrangement of such a machine.

The principal objects of my invention are, first, to provide a multiple drill for piercing button-blanks, which shall be simple in construction and reliable, efficient, and durable in operation; second, to provide a button-drilling machine in which the chuck receiving the button-blanks is adapted to eject the button when formed or pierced; third, to provide in a button-drilling machine a chuck adapted to receive one or more button-blanks and to present the same for piercing to the drills, said blanks being tightly clamped in the chuck during the movement of the same; fourth, to provide in a button-drilling machine two or more drill-spindles, each consisting of sections united together by a flexible connection, one of said sections being adapted to maintain a horizontal position and the other an oblique position while rotating; fifth, to provide in a button-drilling machine a drill consisting of two sections, one of which is adjustable in the drill-spindle and adapted to receive the other section and to secure the same in the spindle, and, sixth, to provide in a button-drilling machine a grooved guide in which the drill-points are adapted to rotate, said guide adapted to receive the converging drill-points and to present them to the button-blank in a parallel position.

My invention stated in general terms consists of a button-drilling machine constructed and arranged in substantially the manner hereinafter described and claimed.

The nature, characteristic features, and scope of my invention will be more fully understood from the following description, taken

in connection with the accompanying drawings forming part hereof, and in which—

Figure 1 is a side elevation of a button-drilling machine embodying the main features of my invention. Fig. 2 is a top or plan view of said machine. Fig. 3 is a longitudinal sectional view enlarged of one of the drill-spindles, illustrating the two sections thereof, the flexible connection between the sections, the sectional drill carried in one of said sections and means for adjusting the drill in said section. Fig. 4 is an enlarged cross-sectional view taken through the line $x x$ of Fig. 3, illustrating the sleeve and pin secured to one of the drill-sections and adapted to adjust the drill in the spindle. Fig. 5 is an enlarged side elevation of the connection between the two sections of the drill. Fig. 6 is an enlarged longitudinal sectional view taken on the line $y y$ of Fig. 2, illustrating the chuck, the blank-ejecting plug, and the grooved guide receiving the converging drills and presenting the same in parallel operative positions to the button-blanks. Fig. 7 is an enlarged cross-sectional view taken on the line $z z$ of Fig. 6. Fig. 8 is an end elevation of the grooved guide looking in the direction of the arrow in Fig. 6. Fig. 9 is an end elevation of the grooved guide looking in a direction opposite to that indicated by the arrow in Fig. 6; and Fig. 10 is an enlarged longitudinal sectional view taken on the line $y' y'$ of Fig. 2, illustrating the means for advancing and retracting the chuck.

Referring to the drawings, A represents the bed-plate of the button-drilling machine secured by bolts A^2 to the frame A' . At one end of the bed-plate are secured the standards or uprights B B, in which the driving-shaft C of the machine has its bearings. The driving-shaft C is driven by the pulley D, secured thereon and connected to any power-wheel by a belt. (Not shown.) The shaft C carries at one end a box E, provided in its interior with gear-teeth a , adapted to mesh with suitable gear-wheels or pinions b , secured to the butt or shank d of the drill-spindles F. The butts or shanks d of the drill-spindles F are supported in a horizontal position in suitable bearings or standards G G, secured to and projecting above the bed-plate

A of the machine. The forward ends e of the drill-spindles F are supported in an inclined position in suitable bearings or standards H H , which are secured to and project from the bed-plate of the machine. The ends e of the drill-spindles F carry at their free ends the drills f , which are guided or supported in a frame or standard I , supported on the bed-plate A in the manner hereinafter explained.

Referring to Figs. 1, 2, and 3, the spindle F of each drill consists of the two sections d and e , one of which, d , is rotated in substantially a horizontal plane, while the other, e , is rotated in a plane at an angle to the plane of the other section. This is necessary because the drills f , which are carried by the sections, converge toward the center of the button-blank.

The two sections d and e are united by a flexible connection, as follows: The end of the section d , which is adjacent to the end of the section e , is slightly rounded, as indicated in full and dotted lines at g , in Fig. 3. At approximately the center of the section d is formed a conical recess h , adapted to receive a conical projection i on the contiguous end of the section e . This projection i is less in diameter at the base than the diameter of the base of the conical recess h . The rounded end g of the section d is provided with a projecting finger j , adapted to enter and partially fill a corresponding recess k in the contiguous end of the section e . The recess k is about the same width as the finger j , but slightly longer and deeper than said finger. This connection between the sections d and e permits of the sections e being bent vertically to the plane of the sections d and permits the forward split ends of said sections e converging, as indicated in Figs. 1 and 2, while still rotating with the other sections d . Each section e is hollow, as shown at m , and sliding in the recess thus formed is placed a butt or shank m' , flattened on one side, as at m^2 , and notched at its forward end m^3 . This slide m' is secured by a pin m^4 to a ring m^5 , encircling the section e , said pin passing through the elongated slots m^6 , leading from the central recess m to the outer surface of the section, substantially as indicated in Figs. 3 and 4. A screw m^7 is adapted to clamp the slide m' in its recess m in any required position. The notched end m^3 is adapted to receive the corresponding V-shaped end of a drill-point f , substantially as indicated in Figs. 3 and 5, and the drill-points f are clamped in the split end of the section e by a cap l . The forward ends of these drill-points f are supported in inclined grooves f' in the standard I , and are then supported in a grooved guide n and confined in the grooves n' thereof by a sleeve n^2 , secured to the standard I , substantially as shown in Fig. 6. The guide n , at its base n^3 —that is to say, the end next to the standard I —is slightly conical and terminates at the forward end in a cylindrical or

straight portion n^4 . In the conical section n^3 are grooved the square channels n^5 , which are slightly wider than the diameter of the drill f and are inclined at the same inclination the drills f receive from the support I , as illustrated in Figs. 6 and 8. These channels n^5 are continued in the straight portion n^4 in a horizontal line, as indicated at n^6 , and the width of the channels n^5 at that point is the same as the diameter of the drill-point f , as illustrated in Figs. 6 and 9. The drill-points f are confined in the channels by the sleeve n^2 , and are bent into conformity with the channels thereby. The drills f are thus bent from the converging planes to the horizontal parallel planes and presented to the button-blanks N in a parallel horizontal position.

Secured to or integral with the sleeve n^2 is a screw-threaded collar o , on which is adapted to be secured a split thimble or sleeve p , which surrounds the sleeve n^2 and projects beyond the same, as indicated in Fig. 6. This thimble p is made of spring metal for the reasons hereinafter stated, and is provided with a beveled end p' . The chuck consists of a split thimble or sleeve q , of spring metal, beveled, as at q' , and adapted to enter the projecting portion of the thimble p' and to be compressed thereby. In this chuck q is placed one or more button-blanks N , substantially as shown in Figs. 6 and 7, which are slightly larger than the interior diameter of said thimble q . The blanks N are introduced in the thimble q , against the tension of its spring-arms q^2 , and confined thereby in the thimble. The thimble q is secured by pins q^3 , or in any suitable manner, to a hollow shaft r , the free or rear end of which terminates in a screw-threaded box r' , provided with exterior guides or keys r^2 , adapted to slide in corresponding guide or key ways in the support K , projecting from the bed-plate A , as illustrated in Figs. 1, 2, and 10.

The hollow shaft r slides back and forth on a shaft s , the rear end of which is screw-threaded, as at s' , and engages the threaded interior of the box r' , and serves thereby to advance or retract said box and thimble q on the shaft s . The shaft s is supported in said box r' , and in a bearing L , projecting from the bed-plate A , substantially as indicated in Figs. 1, 2, and 10. The forward end of the shaft s carries a lug or projection s^2 , which, when the hollow shaft r and thimble q are retracted on the shaft s , presses the blanks N out of said thimble, and ejects them into a box or drawer M , as illustrated in Figs. 1 and 2. The shaft s is rotated by a hand-wheel s^3 , secured to the end of said shaft.

In operation, the chuck q is withdrawn from the thimble p by turning the hand-wheel in one direction. The button-blanks N are pressed into the chuck and held therein by the tension of the spring-fingers q^2 . The hand-wheel s^3 is then turned in an opposite direction and the chuck q advanced toward and telescoped in the drill-thimble p , sub-

stantially as illustrated in Fig. 6, the bevels q' and p' permitting the easy entrance of the chuck into the thimble p . The chuck and blanks N are advanced against the rotating drill-points until the holes in the blanks are pierced. The hand-wheel is then turned in a reverse direction and the chuck withdrawn from the thimble p a distance sufficient for the plug s^2 to push the pierced blanks out of the chuck, from which they drop into the drawer or receptacle M .

It will be seen that during the operation of drilling the button-blanks are tightly clamped in the chuck by the spring-arms q^2 thereof, and also by the thimble p' of the drill.

Should one or more of the drill-points break during the operation of the machine, the point can be removed from the section e by loosening the cap l at the extreme end of the section, and a new drill-point readily inserted. The flat surface m^3 of the slide m' serves to locate the position of the V-shaped socket m^3 , so that the drill-point may be inserted in a correct position to engage at its end the said socket m^3 .

As the drill-points gradually wear off, the slide m' may be advanced by the ring m^5 and pin m^4 , the screw m^7 being loosened for that purpose, until the drill-point is of proper length, when the screw m^7 is again tightened.

It will be manifestly obvious that the machine hereinbefore described may be employed to drill metallic or other blanks and is not therefore to be limited to the drilling of button-blanks alone or pearl buttons or the like.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a drilling machine of the character described, a drill spindle consisting of two separable sections, one of which is supported in a horizontal position while the other is supported in a position diverging therefrom, a conical projection carried by one section adapted to loosely fit in a corresponding recess of the other section, a finger carried by the other section adapted to loosely fit in a corresponding recess in the first section, a drill carried by the diverging section and mechanism for rotating said drill spindle, substantially as and for the purposes set forth.

2. In a drilling machine of the character described, two or more drill spindles having horizontal parallel portions and converging portions separable from each other and united together by a flexible connection, each of the converging portions being hollow and longitudinally slotted, a slide movable in each hollow section, a pin engaging said slide and traveling in the longitudinal slot of said sec-

tion, a ring secured to said pin and encircling the hollow section, a screw adapted to clamp the slide in the section, a drill point adapted to enter said hollow section and to be locked therein to said slide, and mechanism for rotating said drill spindles, substantially as and for the purposes set forth.

3. In a drilling machine of the character described, a grooved guide consisting of a conical base grooved to receive converging drill points and a straight cylindrical portion grooved to receive the drill points and to bend the same into horizontal parallel operative position, and a sleeve adapted to be placed over said grooved guide to confine the drill points in said grooves, substantially as and for the purposes set forth.

4. In a drilling machine of the character described, drills and means for rotating the same, a chuck consisting of a split sleeve or thimble, means for advancing or retracting the same, a split thimble surrounding the drills and adapted to receive the chuck when the same is advanced toward the drills, substantially as and for the purposes set forth.

5. In a drilling machine of the character described, a chuck consisting of a split sleeve or thimble adapted to clamp blanks to be pierced in operative position, a hollow shaft carrying said chuck, a screw threaded box secured to said hollow shaft, a screw threaded shaft and a hand-wheel adapted to advance and retract said screw threaded box and hollow shaft to present and withdraw said chuck to and from operative position, substantially as and for the purposes set forth.

6. In a drilling machine of the character described, a chuck consisting of a split sleeve or thimble adapted to clamp blanks to be pierced in operative position, a hollow shaft carrying said chuck at one end and provided with a screw threaded box at the other end, a shaft traversing said hollow shaft and in threaded engagement with the threaded box thereof, a plug carried at the free end of said shaft and traversing the chuck, and a hand-wheel adapted to rotate said shaft and to advance and retract the hollow shaft to thereby present the chuck and blanks in operative position and thereafter withdraw said chuck and present the plug to the blanks to expel the same from the chuck, substantially as and for the purposes set forth.

In testimony whereof I have hereunto set my signature in the presence of two subscribing witnesses.

MARCUS CHERNIC.

Witnesses:

WILHELM VOGT,
GEO. W. REED.