April 2, 1963 V. MILAZZO 3,083,596

PIN-ATTACHED BUTTON FORMING MACHINE

Filed June 14, 1961 5 Sheets-Sheet 1

Fig. 1

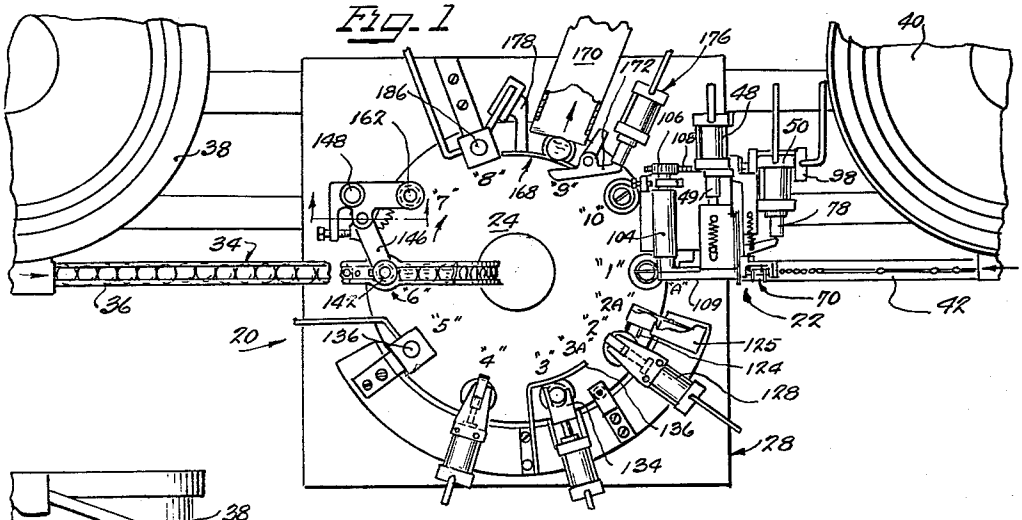
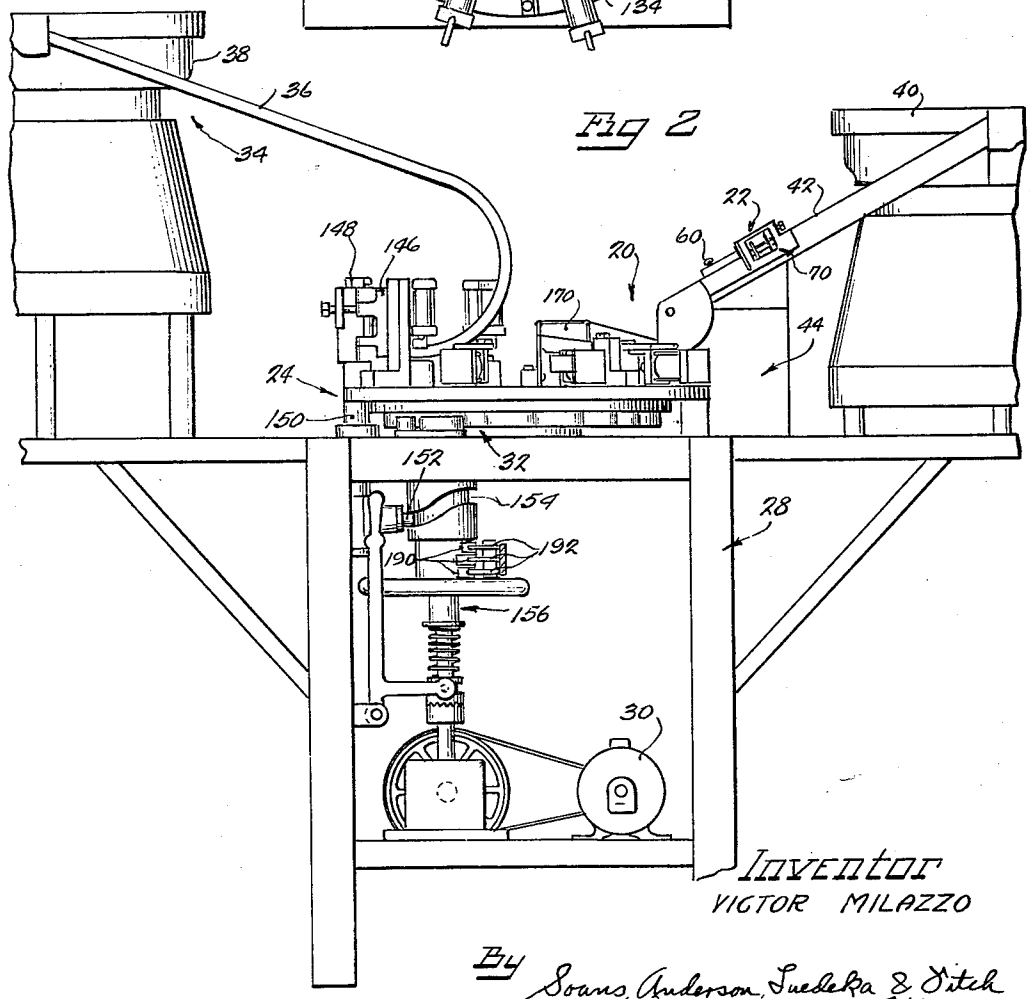


Fig 2



Inventor
VICTOR MILAZZO

By Soans, Anderson, Suedeka & Fitch
Attys

April 2, 1963 V. MILAZZO 3,083,596

PIN-ATTACHED BUTTON FORMING MACHINE

Filed June 14, 1961 5 Sheets-Sheet 2

Fig. 3

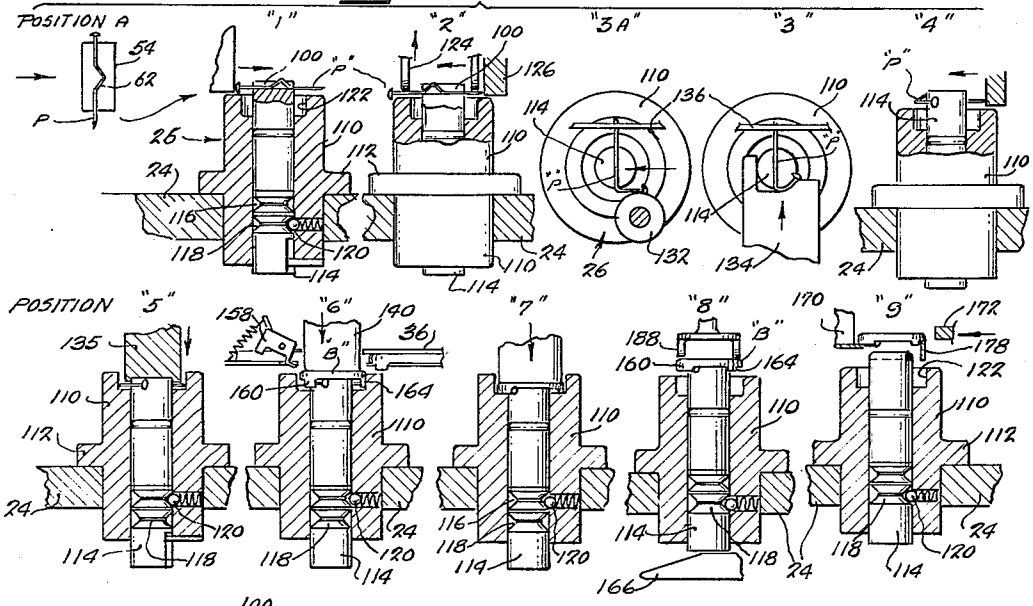


Fig. 4

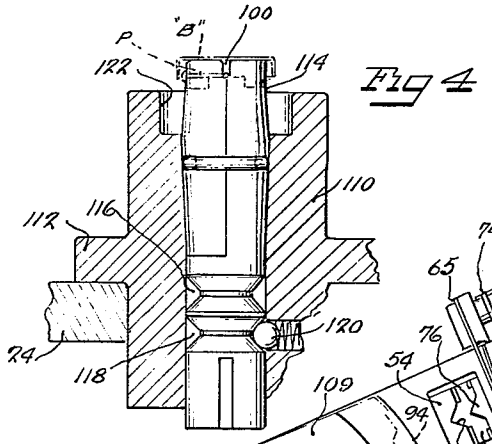


Fig. 5

Fig. 10

Inventor
VICTOR MILAZZO

By Soans, Anderson, Suedeka & Ditch
Attys

April 2, 1963 V. MILAZZO 3,083,596

PIN-ATTACHED BUTTON FORMING MACHINE

Filed June 14, 1961 5 Sheets-Sheet 3

Fig. 6

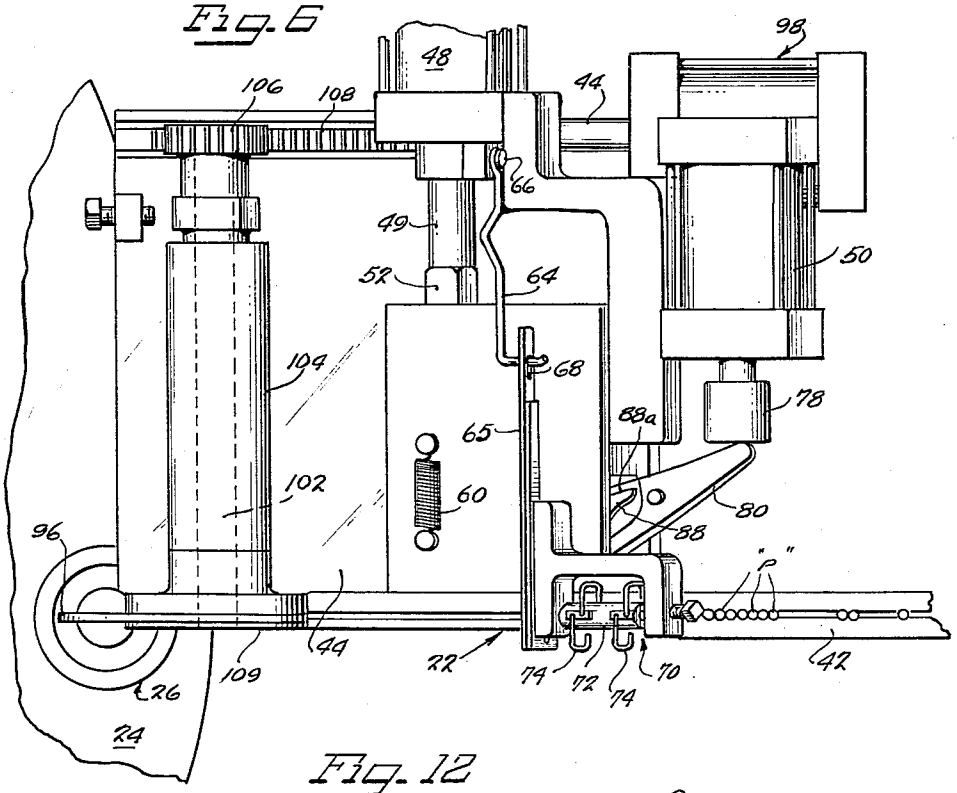


Fig. 12

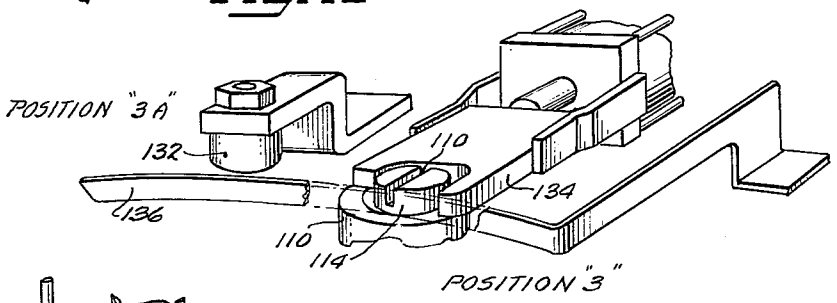
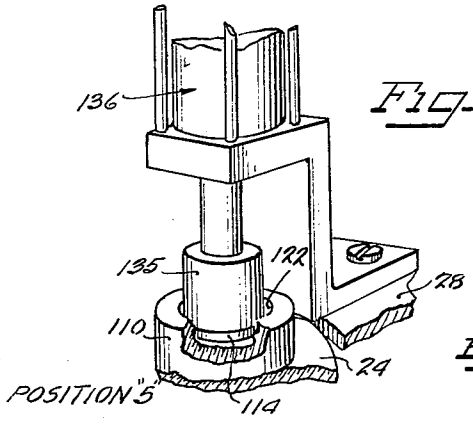


Fig. 13



Inventor
VICTOR MILAZZO

By Soans, Anderson, Swedeka & Ditch
Attys

April 2, 1963 V. MILAZZO 3,083,596

PIN-ATTACHED BUTTON FORMING MACHINE

Filed June 14, 1961 5 Sheets-Sheet 4

Fig. 7

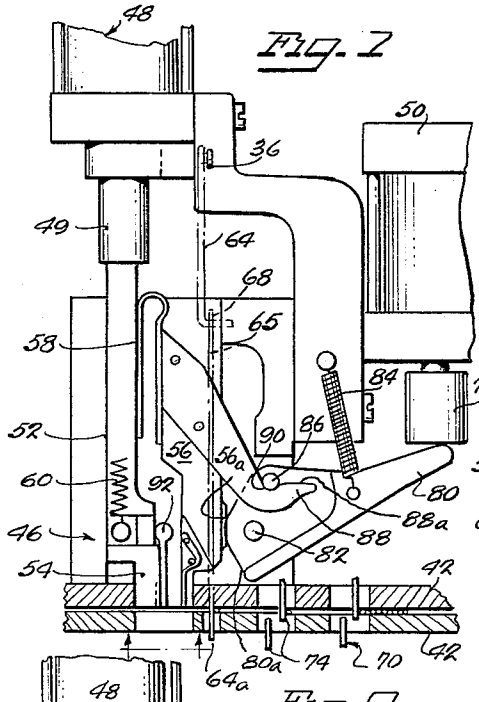


Fig. 8

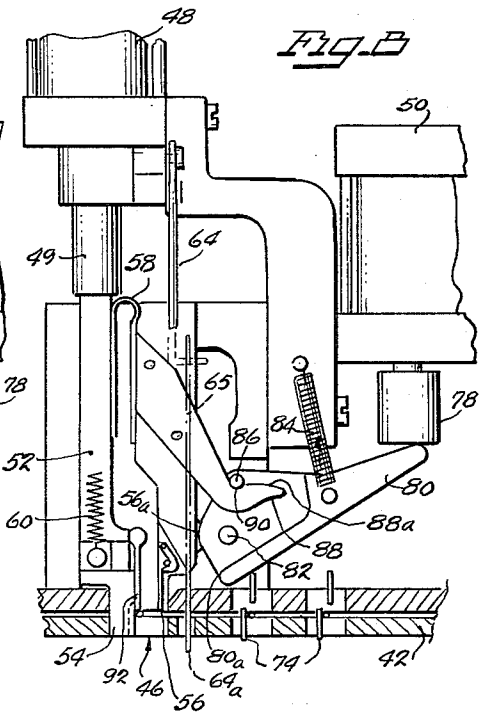


Fig. 9

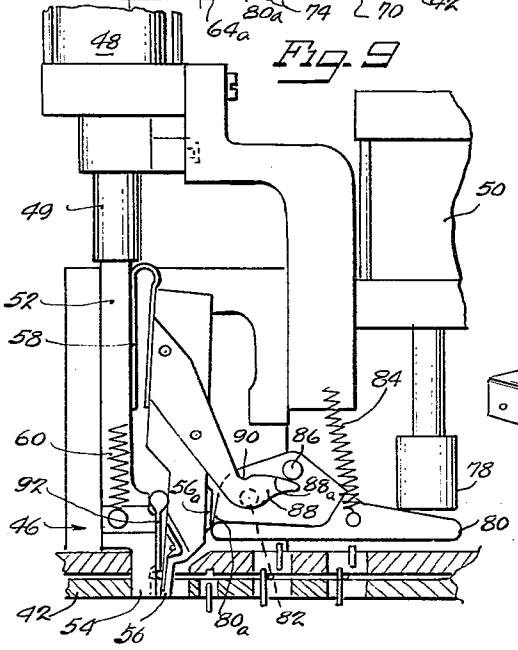
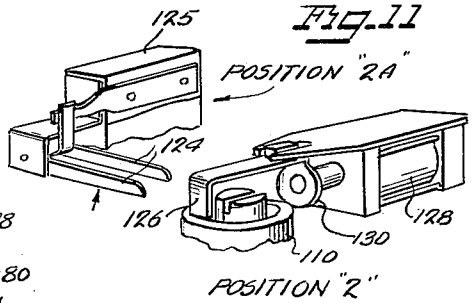


Fig. 10

Fig. 11



Inventor

VICTOR MILAZZO

By Soano, Anderson, Swedeka & Ditch

Attys

April 2, 1963 V. MILAZZO 3,083,596

PIN-ATTACHED BUTTON FORMING MACHINE

Filed June 14, 1961 5 Sheets-Sheet 5

Fig. 14

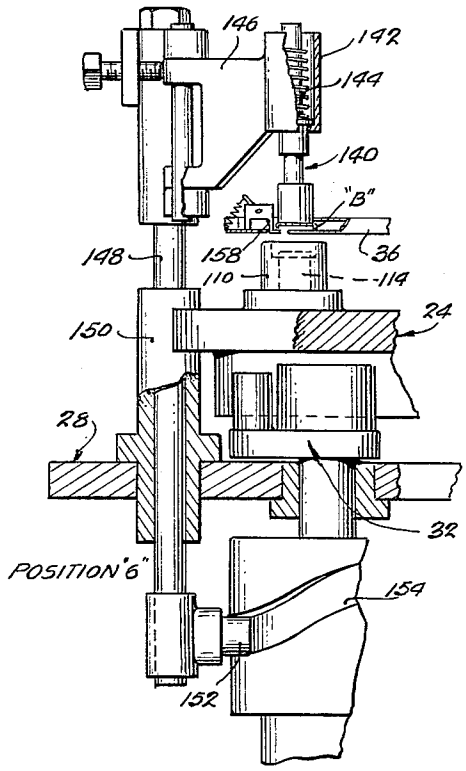


Fig. 15

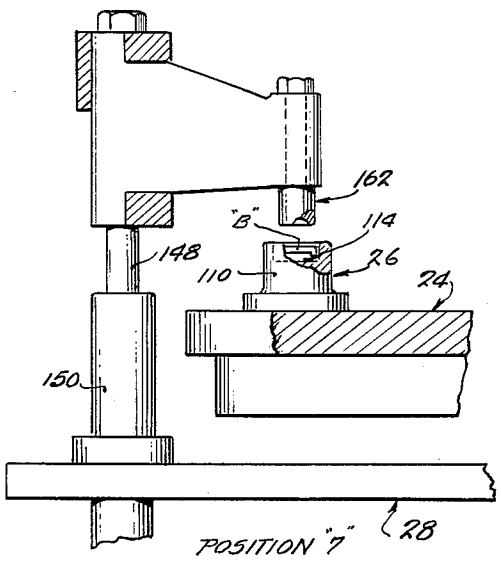


Fig. 16

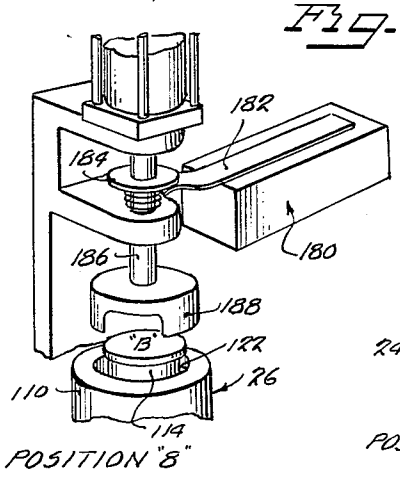
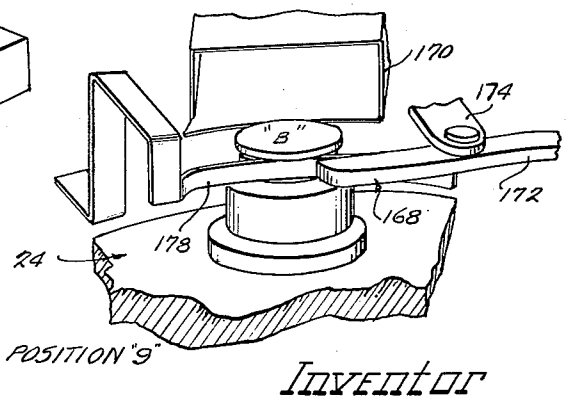


Fig. 17



Inventor

VICTOR MILAZZO

By Soans, Anderson, Suedeka & Ditch

Attys

United States Patent Office

3,083,596

Patented Apr. 2, 1963

3,083,596

PIN-ATTACHED BUTTON FORMING MACHINE

Victor Milazzo, Chicago, Ill., assignor to Van-Mico Products, Inc., Chicago, Ill., a corporation of Illinois

Filed June 14, 1961, Ser. No. 117,186

9 Claims. (Cl. 79—3)

The present invention relates generally to apparatus for the formation of buttons or badges incorporating attaching pins, and is more particularly directed to a button forming machine which is adapted to automatically form and assemble the button and attaching pin.

The production of buttons or badges of the type having attaching pins, and which are used generally in connection with political campaigns, conventions, etc., has heretofore involved rather complicated mechanisms and frequently required considerable hand labor. It is the primary object of the present invention to provide apparatus for automatically forming and assembling such buttons in a novel and improved manner. A further object of the invention is to provide apparatus which is particularly adapted to the formation of buttons which include the use of a common pin as the button attaching means. Still another object of the invention is to provide apparatus which is adapted to automatically handle, form and assemble individual pins and button blanks.

Further objects and advantages will become apparent from the following description of the selected embodiment, which is illustrated in the accompanying drawings, wherein:

FIGURE 1 is a schematic plan view of the button forming apparatus, with portions thereof broken away;

FIGURE 2 is a side elevational view of the apparatus with portions thereof broken away;

FIGURE 3 is a series of schematic illustrations of the pin forming and button forming and assembling operations carried out by the apparatus;

FIGURE 4 is an enlarged cross-sectional view of one of the forming dies in the rotating table;

FIGURE 5 is an enlarged side elevational view of a portion of the apparatus seen in FIGURES 1 and 2, with parts thereof broken away;

FIGURE 6 is a plan view of the mechanism shown in FIGURE 5;

FIGURE 7 is a fragmentary view of the structure in FIGURE 6, with portions thereof broken away and in section;

FIGURES 8 and 9 are similar to FIGURE 7, but show certain of the machine elements in different stages of operation;

FIGURE 10 is an enlarged, perspective view of a portion of the apparatus which is also seen at position 2A in FIGURE 1;

FIGURE 11 is an enlarged, perspective view of a portion of the pin forming apparatus, seen at position "2" in FIGURES 1 and 3;

FIGURE 12 is an enlarged, perspective view of a portion of the pin forming apparatus, illustrating positions "3A" and "3" seen also in FIGURES 1 and 3;

FIGURE 13 is an enlarged, perspective view of another portion of the button forming apparatus, seen also in part at position "5" in FIGURES 1 and 3;

FIGURE 14 is an enlarged, fragmentary side elevational view of the apparatus in FIGURE 2, with reference particularly to the structure at position "6" in FIGURES 1 and 3;

FIGURE 15 is an enlarged, fragmentary side elevational view of the apparatus, with reference particularly to the structure at position "7" in FIGURES 1 and 3;

FIGURE 16 is an enlarged, perspective view of a portion of the apparatus in FIGURE 2, illustrating mechanism seen at position "8" in FIGURES 1 and 3;

FIGURE 17 is an enlarged, perspective view of a portion of the apparatus in FIGURES 1 and 2, which is also seen at position "9" in FIGURE 3; and

FIGURE 18 is a rear plan view of the assembled button.

The illustrated embodiment of the invention is shown in connection with the formation of buttons similar to those disclosed and claimed in my United States Patent No. 2,762,146, dated September 11, 1956. This mechanism is particularly advantageous in the automatic formation of such buttons, but it will be understood that various features of this invention might also be employed to advantage in connection with the formation of other types of buttons having pin attaching portions.

Generally, the illustrated mechanism 20 takes common pins, that is, pins having head portions, and forms and assemblies such pins with metal buttons in a continuous and automatic manner. The metal blanks for the buttons are sequentially fed into the machine at one position and the pins are sequentially fed into the machine at another position. The pins are straight when supplied to the machine, and the buttons are partially formed in that they are suitably printed and at least a portion of the periphery includes a downwardly depending flange which is to be later used in securing the pin to the button.

As the pins are fed into the machine, they are separated and individually bent intermediate their ends to provide the shape shown in FIGURE 3 at position "A." This initial bending of the pin is accomplished in the pin feed mechanism 22 disposed along one edge of the button forming machine 20. The button forming machine includes a central turret portion 24 which is provided with a series of circumferentially arranged stations, numbered "1" through "10" in FIGURE 1, and each of these stations includes a die means 26 (see also FIGURE 3) for receiving one of the pins. The machine turret 24 is movable intermittently about its center axis, with one of the stations being indexed with respect to the pin feed mechanism 22 at each movement of the turret. As the turret revolves, the pins are formed into the desired shape, and the metal button blank is placed in overlying relation to the pin, as indicated at position "6," in FIGURE 3. The blank is then deformed to crimp a depending peripheral flange portion about the end of the pin at a position adjacent the head of the pin, to thereby secure the pin in position on the button. At a subsequent station "9" on the turret, the assembled button is discharged from the machine. As the turret revolves, each of the stations, with one exception to be noted, includes a pin or a pin and button blank in some stage of its formation, so that each advancement of the turret results in the discharge of a finished button.

With reference particularly to FIGURES 1 and 2, it will be seen that the button forming machine 20 includes a supporting frame structure 28 for the rotatable turret 24 which is suitably driven by a motor 30, as through a Geneva drive, indicated generally at 32, to provide for intermittent rotation of the turret. Adjacent the turret is a button supply and feed means 34 in the form of a selective feed mechanism which provides for continuous feed of individual button blanks into a downwardly inclined slide 36 from a hopper 38 into which the blanks are deposited in bulk. The other side of the turret 24 has adjacent thereto a similar type of hopper means 40 for continuously delivering common pins into a downwardly inclined track 42. Adjacent the lower end of this track is the pin feed mechanism 22, which is operable to

select the leading pin in the track 42 and form it into a desired initial shape, while preventing further downward movement of the succeeding pins, and then deliver the pin to a station on the turret 24. This pin feed mechanism 22 is seen in greater detail in FIGURES 6–9, wherein it is shown as comprising a sub-frame structure 44 carried by the main frame 28 and supporting a pin-forming die mechanism 46 and a pair of fluid pressure-operated cylinders 48 and 50 for operating the die members. The cylinder 48 has the front of its piston portion 49 abutting a slide 52 which is guidably mounted on the frame 44 and has the leading or lower part 54 of the pin-forming die structure 46 at its outer or free end. The die mechanism 46 is formed of two relatively movable plate sections, providing a female die portion 54 and a male die portion 56 which are normally urged apart by a generally U-shaped spring 58 disposed adjacent their inner ends. In the illustrated embodiment, the power cylinder 48 is of the single acting type, and a coil spring 60 is interposed between the outer end of the slide 52 and the frame 44, to bias the female die 54 and piston 49 inwardly toward the cylinder. The leading die section 54 is movable across the path of the pins moving downwardly in the track 42, and this section 54 is the female die portion which includes a recess or groove 62 (FIGURE 5) disposed adjacent an intermediate portion of the length of the pins as they are supported in the track by their head portion. The male die section 56 is disposed rearwardly of the female die, i.e., to the right in FIGURES 5–9, and is moved forwardly across the path of the track 42 and then downwardly along the track into engagement with the female die 54, through operation of the piston 78 of cylinder 50.

As the female die section 54 moves across the pin track 42, it triggers a selector device 70 (FIGURES 5 and 6) through means of a connecting link 64 which is attached at one end to piston 49 at stud 66 and at the other end to a slide member 65 by a pin and slot type of lost motion connection 68. The selector device 70 comprises a rotatable shaft 72 which is connected to the slide 65, and the shaft 72 has secured thereto a series of longitudinally spaced-apart wire loops 74 or the like. As the shaft 72 is rocked in either direction, it frees the leading pin in the selector 70 for movement into engagement with the female die section 54, while permitting the leading pin in the track at the rear of the selector to advance into the selector device. In the illustrated structure, the selector device 70 includes four staggered loops 74, so that the pins move through the selector device in two steps, thereby further assuring passage of only one pin into the die at a time.

During the initial motion of the female die section 54 across the track 42, the end of the link 64 moves in the slot 68 and, consequently, there is no accompanying movement of the selector device 70. However, as this lost motion is completed and the female die section 54 has completed its movement across the track, the selector device 70 is operated to release a pin for sliding movement down track 42 to a position of engagement with the female die 54. The male die section 56 is then moved across the track and into engagement with the female die section 54 and the pin held thereby. As indicated previously, the male die section is provided with an angularly protruding portion 76 which is complementary to the recess 62 in the female die portion, so that movement of the die portions together deforms an intermediate section of the pin to provide the bent shape seen in FIGURE 3 at "A."

The positioning and crimping movement of the male die portion in relation to the female die is provided for by the power cylinder 50 (FIGURES 7–9) having a piston portion 78 which is engageable with a cam lever 80 pivotally mounted, by a pin 82 or the like, on the frame 44 of the pin feed mechanism. This lever 80 is biased into engagement with the piston 78 by a spring 84, and the lever also includes a pin or roller 86 which engages the outer end of an arm 88 fixed to the male die section. As the piston 78 is extended, it moves the lever 80 clockwise, as seen in the drawings and, in so doing, moves the pin 86 out of the groove 90 and along the edge 88*a* of the arm to thereby force the male die section 56 forwardly into position against the lower die 54 and behind the pin. In this latter respect, it wil lbe noted that the male die section 56 has a bearing surface 56*a* which is held in contact with a cam surface 80*a* on lever 80 by a spring 58. Continued forward movement of lever 80 by piston 78 causes cam surface 80*a* to drive the male die 56 into forming engagement with the pin through engagement of the protruding portion 76 with the complementary groove 62 in the female die (FIGURE 5). The piston 48 then moves back away from the slide 52, while the latter is held in place by engagement of the male die 56 against the tension of spring 60. Piston 78 is then retracted to release the spring biased lever 80, and thereby separate and retract male die 56 from the female die 54. Disengagement of the die sections allows spring 60 to pull slide 52 and the female die 54 thereon back to its retracted position seen in FIGURE 7. In this respect, it will be noted that there is provided a stripper 92, in the form of an arm which is fixed on the sub-frame 44, which acts against the pin in a fashion such that it insures positive separation of the pin from the dies as the latter are withdrawn, to thereby permit continued movement of the bent pin down the inclined track 42.

As the deformed pin slides downwardly in its track 42 it engages a complementary cavity 94 in an arm 96 at the end of the track, which arm is seen particularly in FIGURE 5. The arm 96 moves downwardly through an arc of approximately 120°, in response to actuation of another power cylinder 98 (FIGURE 6), to deposit the bent pin in the transverse slot 100 (FIGURE 5) formed at the upper end of the underlying pin-receiving station on the rotatable turret 24. More particularly, the arm 96 is fixed to one end of a shaft 102 which is journalled in a housing 104 on the frame 44, and the other end of the shaft 102 includes a spur gear 106 fixed thereto. A toothed rack 108 is disposed along the frame in position for meshing engagement by the spur gear and rack 108 is connected with the piston portion of the power cylinder 98, so that actuation of the latter causes sliding movement of the rack 108 and the described swinging movement of the pin transfer arm 96. A stationary cover plate 109 (FIGURE 5) is secured to the frame 44 in position to cover the path of cavity 94 during movement of the arm 96, so as to prevent loss of the pin during transfer to the forming die 26.

As noted particularly in FIGURE 1 and FIGURE 3, there are ten of the pin-receiving stations disposed circumferentially of the rotatable turret. Each of these stations include a generally cylindrical housing or sleeve 110 which is seated in a complementary opening through the turret plate structure 24, and the housing 110 is retained in axial position through means of an integrally formed collar portion 112 (FIGURE 4). The housing 110 includes an axial bore into which is positioned a cylindrical die or plunger structure 114 having the transverse slot 100 at its upper end for receiving one of the pins "P" from the pin feed device 22. The slot 100 is sufficiently deep so that it cooperates with the intermediate bent portion of the pin in preventing rotation of the pin in the die.

More particularly, the upper portion of plunger 114 is made in two sections, with a separable and generally semi-cylindrical section 114 being held in place by a spring 115 or the like which is received in an annular groove formed around the two sections. The diametrically disposed and mating edges of the two sections of plunger 114 are provided with shoulder portions to provide the groove 100. Moreover, at least the section 114*a* is preferably tapered downwardly along its outer surface, and

the shoulder portions are formed so that as the plunger 114 is drawn downwardly into the bore of housing 110, the pin supporting shoulder portions are cammed into closer engagement to tightly grip the pin "P." The stations are equally spaced about the periphery of the turret plate 24, and the drive means is so related to the turret plate that it provides for intermittent rotation of the turret plate in a manner such that one of the pin-receiving stations is indexed in time with the arm 96 on the pin feed mechanism.

Referring particularly to FIGURE 3, it will be seen that each of the dies or plungers 114 include a pair of annular grooves 116 and 118 adjacent its lower end. These grooves provide a pair of detents for receiving a spring biased ball 120 carried by a bore in the housing to releasably lock the plunger 114 in a predetermined axial position. When the ball 120 is seated in the upper detent 116, the die is disposed with its pin-receiving head portion located within the annular recess 122 at the upper end of the die plunger housing. When the ball is seated in the lower detent 118, the head portion of the die 114 is elevated above the upper level of the housing 110, as seen in FIGURE 3 at positions "8" and "9."

After a pin has been deposited into the die of the pin-receiving station, as indicated at position "1" in FIGURE 3, the turret 24 is rotated through an angle of about 36° to a position of rest at the next position indicated at "2" in FIGURE 1. However, as the pin moves toward position "2," it first encounters a pair of parallel, overlying arms 124 (see also FIGURE 10) which extend along its path of movement, as indicated at "2A" in FIGURE 1, and which serve to maintain the pin in position within the recess and, also, to operate a micro switch 125 to stop the machine in the event the pin feed mechanism 22 failed to deliver a pin to the die 26 on turret 24. After the pin enters position "2" (FIGURE 3), the pointed end of the pin is engaged by a movable arm 126 which repositions the pin in the slot 100 in readiness for the next forming operation. This movable arm 126 (FIGURE 11) is connected to a power cylinder 128, including a piston 130 having the arm 126 connected thereto. The piston is extended as the pin forming die moves into position "2," and the piston is then retracted to cause the arm 126 to engage the pin point and move the pin radially outwardly with respect to the turret.

Having properly positioned the pin in the die, the turret 24 is again rotated, clockwise in FIGURE 1, through an arc to the position "3." As the pin moves past the position indicated at "3A," the head portion of the pin engages a roller 132 (FIGURE 3) which is disposed to engage and bend this head portion at right angles with respect to the remainder of the pin. As the die and pin come to rest at position "3," a piston-operated jig 134 (FIGURE 12) moves into engagement with the head end portion of the pin and bends this portion around the cylindrical die plunger 114, as seen at position "3" in FIGURE 3. Position "3" also includes a curved bar 136 which is disposed in closely overlying relation to the pointed end of the pin. This bar serves to hold the pin against vertical displacement during the described bending operation of the jig 134.

The die containing the finally bent pin is now moved to position "4" (FIGURES 1 and 3), which includes a power cylinder-operated arm identical with that seen at position "2," and which again re-locates the pin transversely of the die to place the pin in the proper position for the next forming operation.

The pin is then moved to position "5" where an overlying plunger 135 moves downwardly in response to actuation of a fluid-operated cylinder 136, to force the die 114 into its lowered position within the housing 110, as seen in FIGURE 3. In this position, the formed pin, as well as the upper end of the die 114, are disposed within the cylindrical recess 122 in the die housing 110. The next operation of the turret 24 moves the pin to position "6," where a button blank "B" is placed in overlying position with respect to the end of the die plunger 114 and formed pin "P."

The button-positioning mechanism is seen more particularly in FIGURE 14, where it is noted that the upper end of a plunger 140 is supported in a housing 142 including a coil spring 144 disposed therein to normally urge the plunger downwardly. The housing 142 is carried by an arm 146 fixed to the upper end of a shaft or rod 148 journalled in a cylindrical bearing housing 150 on the main frame 28. The lower end of this rod has fixed thereto a cam follower 152 which engages a cam track 154 provided on the main drive shaft 156 for the turret. Consequently, as the turret 24 rotates, it provides timed movement of the plunger 140 in a vertical direction. The lower end of the plunger 140 is movable axially of the pin-receiving station and past the end of the track 36 leading from the button supply means 38. The adjacent lower end of track 36 includes a spring-biased gate 158 which supports one edge of the leading button "B" in the track and which is tripped by the downward movement of the plunger 140 to release the button for movement by the plunger onto the protruding end of the pin-forming die 114.

In the illustrated embodiment, the button is released from its track in a position such that the depending peripheral flange portion 160 (FIGURE 3) thereof is closely adjacent to the bent head of the pin "P." After thus placing the button blank on the die 114, the plunger 140 moves upwardly out of the path of the die. As the plunger 140 moves upward passed the end of the track 36, the gate 158 is retracted in readiness for placement of such succeeding button on the succeeding die plunger 114 on the turret.

The turret 24 is again moved to rotate the assembled pin and button blank to position "7," seen in FIGURES 3 and 15, where another plunger 162, also supported by the rod 148 (see FIGURE 1) moves downwardly to complete the formation of the button. The downward movement of the plunger 162 forces the depending flange portions of the button against the bottom of the cylindrical recess and thereby curls these portions inwardly. The flange portion 160, adjacent the head of the pin, is crimped about such head portion to hold the pin in position with respect to the button. A second depending flange portion or lip 164 (FIGURES 3 and 4) is bent inwardly to provide a notched clasp means 165 and entrance 167 (FIGURE 18) for the pointed end of the pin.

The turret 24 is again rotated to move the pin and button assembly from position "7" to position "8" in FIGURES 1 and 3. As the die station approaches position "8," the lower end of the die plunger 114 engages an inclined plate or cam 166 mounted on the frame 28, which forces the die 114 upwardly into projecting relation to its supporting housing 110. This movement raises the completed button to a position free of the cylindrical recess 122 and in readiness for removal from the die.

The button is then moved to the position "9," where a stripper means 168 (seen also in FIGURE 17) removes the button from the pin-receiving die 26 and places it in a discharge trough 170. This stripping means comprises a pivotally mounted arm 172, which is supported intermediate its ends by a bracket 174 carried by the frame, and which is suitably connected at one end to another power cylinder 176 (FIGURE 1). Intermediate position "8" and position "9," there is supported an arcuate track member 178 in position for engagement with a lower edge portion of the assembled button, and this track 178 is inclined slightly so as to lift the button from the die. In so doing, the track 178 cooperates with the edge of the button discharge chute 170, as noted particularly in FIGURE 3. As the die 26 comes to rest adjacent the button discharge chute 170, the power cylinder 176 is

actuated to move the free end of the arm 172 into engagement with the elevated button and force this button into the chute 170, which is preferably inclined downwardly and terminates in a suitable receptacle. Thus, the completed cycle of operation of the turret 24 in the formation of the button is completed. As noted in FIGURE 1, position "10" is a "dead" or open station, and involves no step of the button forming operation.

A suitable counter device (not shown) is incorporated in the described mechanism and, in this connection, it is preferred that a micro switch 180 or the like be arranged in connection with position "8." As noted in FIGURE 16, the blade 182 of the switch is positioned for engagement by a spring biased disc or collar 184 on the plunger 186. In the event there is no button on the die when it reaches position "8," the plunger 186 will move to place its lower end portion 188 in enclosing relation to the upper end of the die plunger 114, and this over travel of the plunger 186 will cause disc to trip the switch 180, which in turn will stop the counter from registering one movement of the turret as a button completing step.

As indicated previously, the power operations conducted while the button structure is being formed on the rotatable turret 24 are all simultaneous in action. Each of the above-described operations at stations "2" through "9" simultaneously provide for a manipulation of a pin "P" and/or a button blank "B," leading toward the final formation of the button assembly at station "7" and the discharge of the button at station "9." The operation of the pin feeding arm 96 is also timed in with the turret operation. The operation of the power cylinders 48 and 50 on the pin-feeding device is, of course, more rapid since each of these cylinders must be actuated and the initially bent pin supplied to the turret in between each stage of advancement of the turret 24. The timing of the cylinders are controlled by the cams 190 on the drive shaft 156, which actuate control valves 192 mounted on the frame 28 in the proper sequence.

Thus, it is seen that there is provided herein an automatic means for the formation of pin-attached buttons, which is adapted for rapid operation and which occupies a minimum amount of floor space. Although shown and described with respect to the formation of a particular type and shape of button, it will be appreciated that various of the features of this invention may be utilized to advantage in connection with the manufacture of other forms of pin-attached buttons.

The various features of the invention which are believed to be new are set forth in the following claims.

I claim:

1. Means for forming a pin-attaching badge comprising a rotatable die supporting means, a plurality of forming dies mounted on said supporting means in circumferentially spaced relation, means on each of said forming dies for receiving a pin in a position with one end portion of the pin extending laterally of the forming die, a first means adapted to place a pin in each of said forming dies as said die supporting means is intermittently rotated to thereby place a forming die adjacent to said first means, a second means adapted to engage the pin held by said forming die and bend said one end portion of the pin as said die supporting means is rotated to move the forming die from said first means to a position opposite said second means, and additional means which is cooperable with said forming die to place a badge blank having a depending flange portion in overlying relation to each of said forming dies and to bend said depending flange into gripping engagement with the projecting bent end portion of the pin held in said die.

2. Apparatus for forming a pin-attaching badge comprising a rotatable die supporting turret, a plurality of forming dies mounted on said turret in circumferentially and uniformly spaced relation for movement therewith about a vertical axis, means on each of said forming dies for receiving a pin in a generally horizontal position with one end portion of the pin extending laterally of the forming die, a pin-feeding means adjacent said turret which is adapted to place a pin in each of said forming dies as said turret is intermittently rotated to thereby place a forming die adjacent to said pin-feeding means, a pin-forming means adjacent said turret which is adapted to engage the pin held by said forming die and bend said projecting end portion of the pin as said turret is rotated to move the forming die from said pin-feeding means to a position opposite said pin-forming means, a badge feeding means adjacent said turret which is operable to place a badge blank having a depending flange portion in overlying relation to each of said forming dies as the latter are rotated to a predetermined position, and additional means adjacent said turret which is movable into engagement with the badge thus placed on the forming die to bend said depending badge flange into gripping engagement with the projecting bent end portion of the pin held in said die, and drive means connected with said turret to provide for intermittent movement of said turret through a predetermined arc and thereby sequentially index each of said forming dies with said pin-feeding means, pin-forming means, badge-feeding means and said additional means.

3. Apparatus for forming a pin-attached badge comprising a rotatable die supporting means, a plurality of forming dies mounted on said supporting means in circumferentially spaced relation for movement therewith about a central axis, means on each of said forming dies for receiving a pin in a generally horizontal position with one end portion of the pin projecting laterally of the forming die, a stationary frame structure adjacent the rotatable die supporting means, a first means on said frame adapted to place a pin in each of said forming dies as said die supporting means is intermittently rotated and then halted so as to place a forming die adjacent to said first means, a second means on said frame adapted to bend said projecting one end portion of each pin as said supporting means is rotated to move a forming die containing a pin from said first means to a position opposite said second means, a third means on said frame which is cooperable with said forming die to sequentially place a badge blank having a depending flange portion in overlying relation to each of said forming dies and to bend such depending flange into gripping engagement with the projecting bent end portion of the pin held by the die, and additional means for stripping the pin-attached badge from the forming die and discharging it from the die supporting means.

4. A machine for making pin-attached buttons comprising a frame structure, a turret carried by said frame for rotation about a generally vertical axis, a plurality of forming dies mounted on said turret in circumferentially spaced-apart positions, each of said forming dies comprising a sleeve portion and a plunger portion fitted within said sleeve in axially slidable relation thereto, the upper portion of said sleeve having an enlarged axial opening to provide an annular recess about said plunger, the upper end of said plunger having a transverse groove formed therein, a pin feed means supported on said frame adjacent said turret and operable to position a generally straight pin within the transverse groove of each of said die plungers as said turret is intermittently rotated to place a die plunger adjacent said pin feed means, means carried by said frame and operable to engage and bend one end portion of a pin held by said forming die into angular relationship with respect to the main shank portion of the pin, a button blank feed means supported on said frame adjacent said turret and in circumferentially spaced relation to said pin feed means, said button feed means being operable to position a button blank having a depending flange portion thereon in overlying relation to said die plunger with the flange portion of the button disposed within said annular recess of the die

sleeve and outwardly adjacent to the bent end portion of the pin held in said die, means for forcing said button blank downwardly in said sleeve to thereby crimp said flange portion against the bent end portion of the pin, means for elevating the die plunger and the button and pin assembly above said annular recess, and a button discharge means carried by said frame in the path of rotation of said forming dies and including means for stripping the button assembly from the die and moving it laterally away from said turret.

5. A machine for making pin-attached buttons comprising a frame structure, a turret plate carried by said frame for rotation about a generally vertical axis, a plurality of forming dies mounted on said turret plate in circumferentially spaced-apart positions, each of said forming dies comprising a sleeve portion and a plunger portion fitted within said sleeve in axially slidable relation thereto, the upper portion of said sleeve having an enlarged axial opening to provide an annular recess about said plunger, the upper end of said plunger having a transverse groove formed therein, a pin feed means supported on said frame adjacent said turret and including means for forming an angularly bent offset portion intermediate the ends of a straight pin and being operable to position the pin within the transverse groove of one of said die plungers as said turret is rotated to index said one die plunger with said pin feed means, means carried by said frame and operable to engage and bend one end portion of a pin held by said forming die into angular relationship with respect to the main shank portion of the pin, a button blank feed means supported on said frame adjacent said turret and in circumferentially spaced relation to said pin feed means, said button feed means being operable to position a button blank having a depending flange portion thereon in overlying relation to said die plunger with said flange portion extending within said annular recess in the die sleeve and outwardly adjacent to the bent end portion of the pin, means for forcing said button blank and die plunger downwardly in said sleeve to thereby crimp said flange portion against the bent end portion of the pin, means for elevating the die plunger and button and pin assembly above said annular recess, and a button discharge means carried by said frame in the path of rotation of said forming dies and including means for stripping the button assembly from the die and moving it laterally away from said turret.

6. A machine for making pin-attached buttons comprising a frame structure, a turret plate carried by said frame for rotation about a generally vertical axis, a plurality of forming dies mounted on said turret plate in circumferentially spaced-apart positions, each of said forming dies including a vertically movable plunger portion having a transverse groove formed in the upper end thereof, and a pin feed means supported on said frame adjacent said turret and comprising an inclined track adapted to support common pins through engagement with the enlarged head end portion thereof and in a manner affording sliding movement of the pins in single file toward said turret, a die means disposed for movement transversely of the path of said track and including a male portion and a female portion which are adapted for sequential movement relative to said track for engagement with a pin and for movement toward each other to thereby form an offset portion in an intermediate section of the pin, a pin selector device in position along said track in advance of said die means and operable to retard the sliding movement of the pins while permitting the advance of a single pin into engagement with one of said die portions, the other of said die portions being thereafter movable across said track and into engagement with the pin to thereby press the pin against said one die portion and form the intermediate offset therein, and a movable member carried by said frame and adapted to receive the pin at the lower end of said inclined track and deposit it in said transverse groove in the upper end of one of said die plungers on said turret.

7. Pin forming apparatus comprising a pin feed means including an inclined track adapted to support common pins through engagement with the enlarged head end portion thereof and in a manner affording sliding movement of the pins in single file downwardly along said track, a die means disposed for movement transversely of the path of said track and including a male portion and a femal portion which are adapted to sequential movement relative to said track for engagement with a pin and for movement toward each other to thereby form an offset portion in an intermediate section of the pin, and a pin selector device in position along said track in advance of said die means and operable to retard the sliding movement of the pins while permitting the advance of a single pin into engagement with one of said die portions, the other of said die portions being thereafter movable across said track and into engagement with the pin to thereby press the pin against said one die portion and form the intermediate offset therein.

8. Pin forming apparatus comprising a frame, an inclined track on said frame adapted to support a common pin through engagement with the enlarged head end portion thereof and in a manner affording sliding movement of the pin downwardly along said track, a die means disposed for movement transversely of the path of said track and including two separate die portions which are adapted, respectively, for sequential movement relative to said track, to first position one of said die portions for engagement by a pin and for movement of the other die portion to the rear of the pin and then toward said one die portion to thereby form an offset portion in an intermediate section of the pin, and a movable member carried by said frame in position to receive the pin at the lower end of said inclined track and to deposit it at a predetermined position spaced therefrom.

9. Pin forming apparatus comprising a pin feed means supported on said frame and comprising an inclined track adapted to support common pins through engagement with the enlarged head end portion thereof and in a manner affording sliding movement of the pins in single file toward said turret, a die means disposed for movement transversely of the path of said track and including a female portion and a male portion which are adapted for sequential movement relative to said track for engagement of one die portion by a pin and for subsequent movement of the other die portion to the rear of the pin and then toward said one die portion to thereby form an offset portion in an intermediate section of the pin, a pin selector device in position along said track in advance of said die means and operable to retard the sliding movement of the pins while permitting the advance of a single pin into said engagement with said one die portion, and a movable member carried by said frame and adapted to receive the pin at the lower end of said inclined track and deposit it at a predetermined position spaced therefrom.

References Cited in the file of this patent

UNITED STATES PATENTS

2,473,116	Wegman	June 14, 1949
2,591,203	Schmalz	Apr. 1, 1952