P. F. DUSHA, A. FEYK & J. KOMANCSEK.

BUTTON MAKING MACHINE.

APPLICATION FILED DEC. 28, 1911.

1,077,337.

Patented Nov. 4, 1913.

6 SHEETS—SHEET 1.

Fig. I.

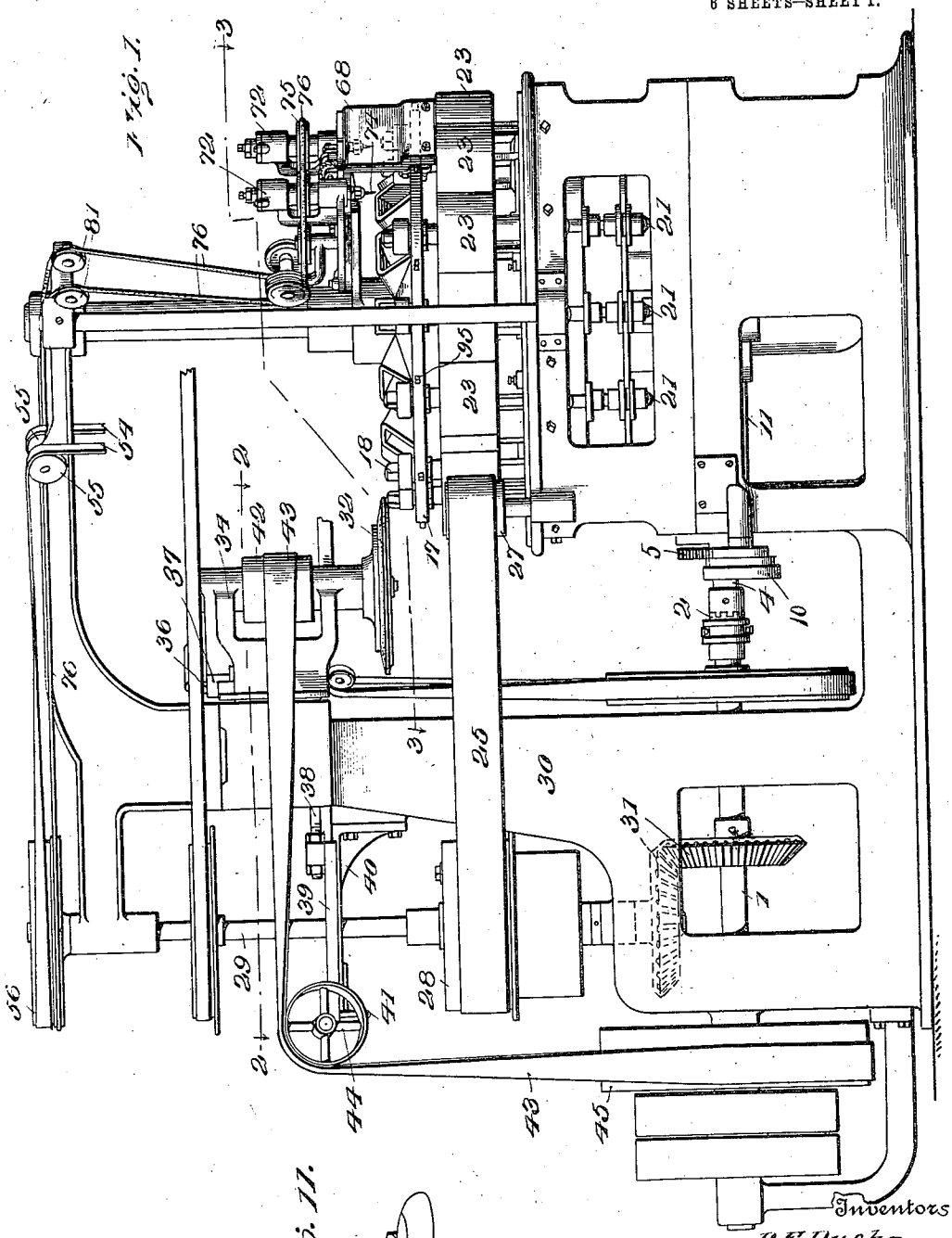
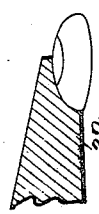


Fig. II.



Witnesses

Ferdinand Espey

Juana M. Fallin

Inventors

P. F. Dusha,

A. Feyk and

J. Komancsek.

By Howson & Howson Attorneys

P. F. DUSHA, A. FEYK & J. KOMANCSEK.

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6 SHEETS—SHEET 2.

Fig. 2.

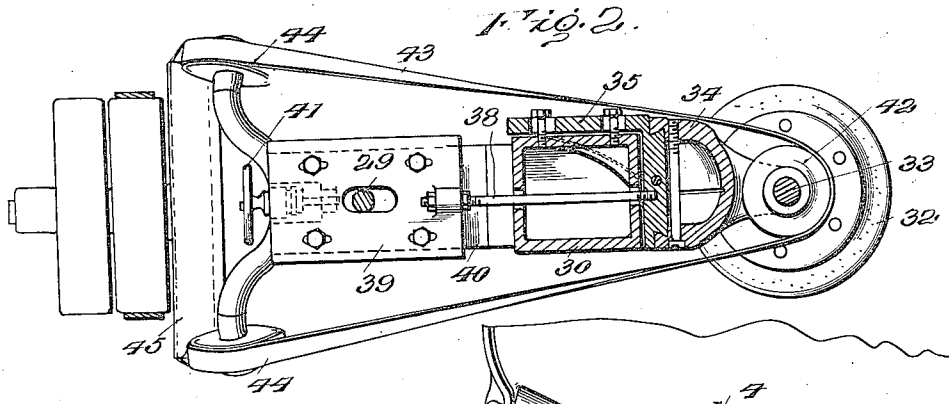
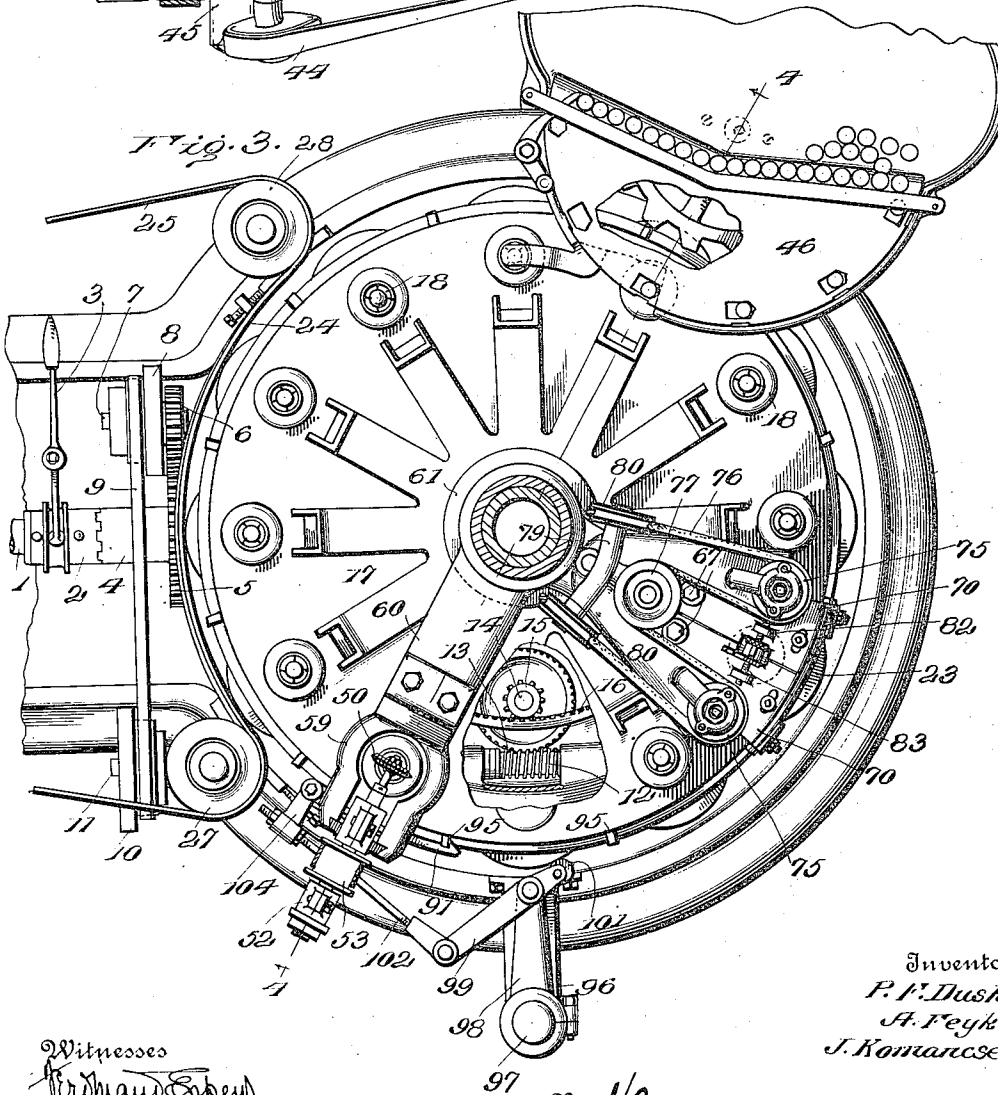


Fig. 3.



Witnesses

Fred Mann Espey

Juana M. Fallin.

Inventors

P. F. Dusha,

A. Feyk and

J. Komancsek.

By Thos. Macy.

Attorneys

P. F. DUSHA, A. FEYK & J. KOMANCSEK.

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6 SHEETS—SHEET 3.

Fig. 5.

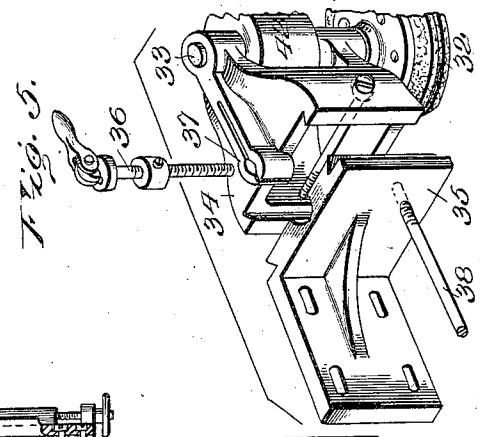


Fig. 4.

Witnesses

Fredmann Espey

Juana M. Fallin.

Inventors

P. F. Dusha,

A. Feyk and

J. Komancsek.

By Thos. Espey, Attorneys

P. F. DUSHA, A. FEYK & J. KOMANCSEK.

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6 SHEETS—SHEET 4.

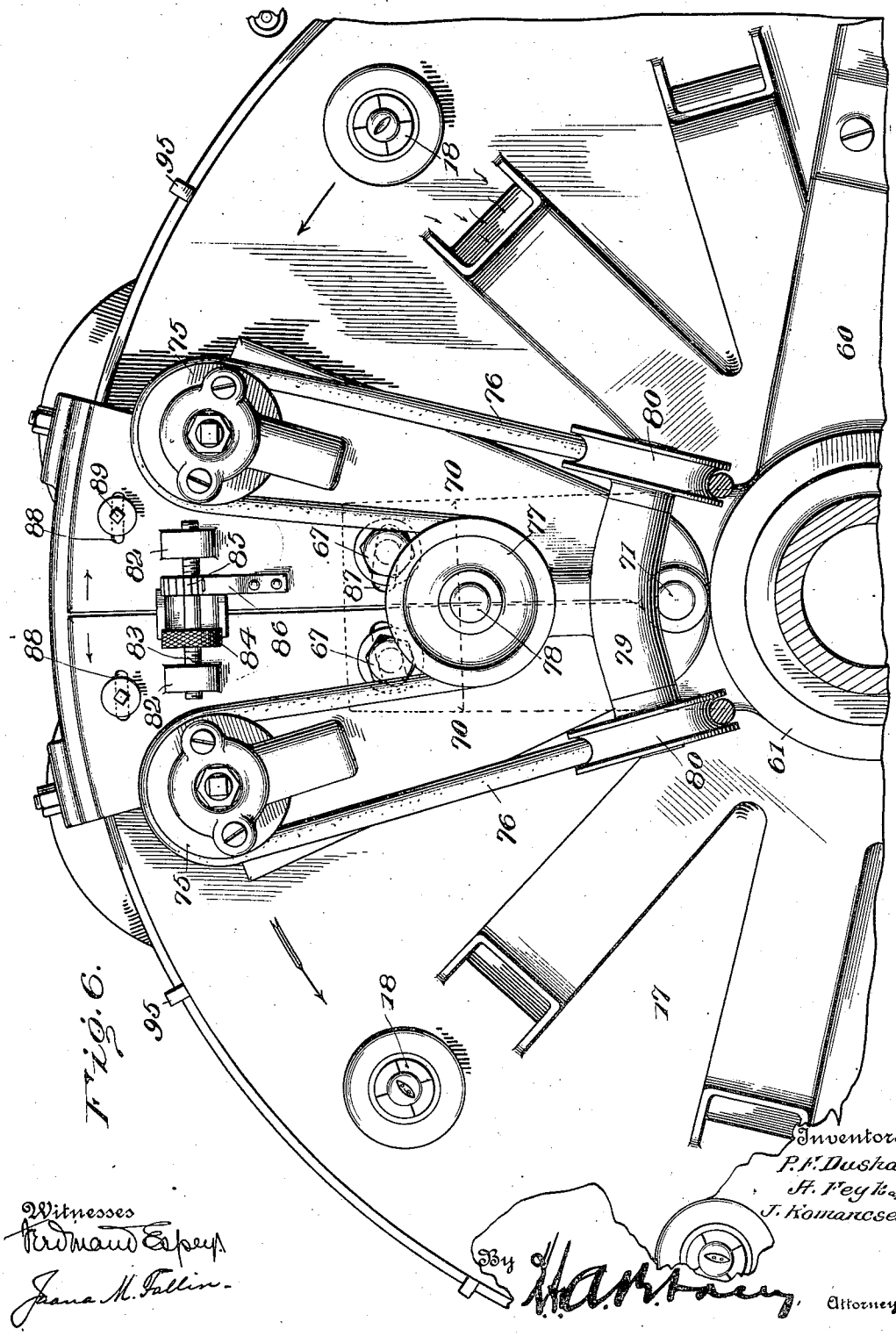


Fig. 6.

Witnesses
Ferdinand Espey
Joana M. Fallin.

Inventors
P. F. Dusha,
A. Feyk and
J. Komancsek.
By Hartner & Harvey, Attorneys.

P. F. DUSHA, A. FEYK & J. KOMANCSEK.

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6 SHEETS—SHEET 5.

Fig. 7.

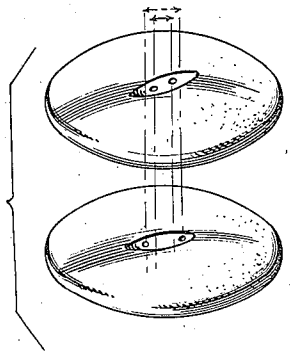


Fig. 8.

Witnesses

Thomas Espy

Joana M. Fallin

Inventors

P. F. Dusha,

A. Feyk and

J. Komancsek.

By

Attorneys

P. F. DUSHA, A. FEYK & J. KOMANCSEK.

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6 SHEETS—SHEET 6.

Fig. 9.

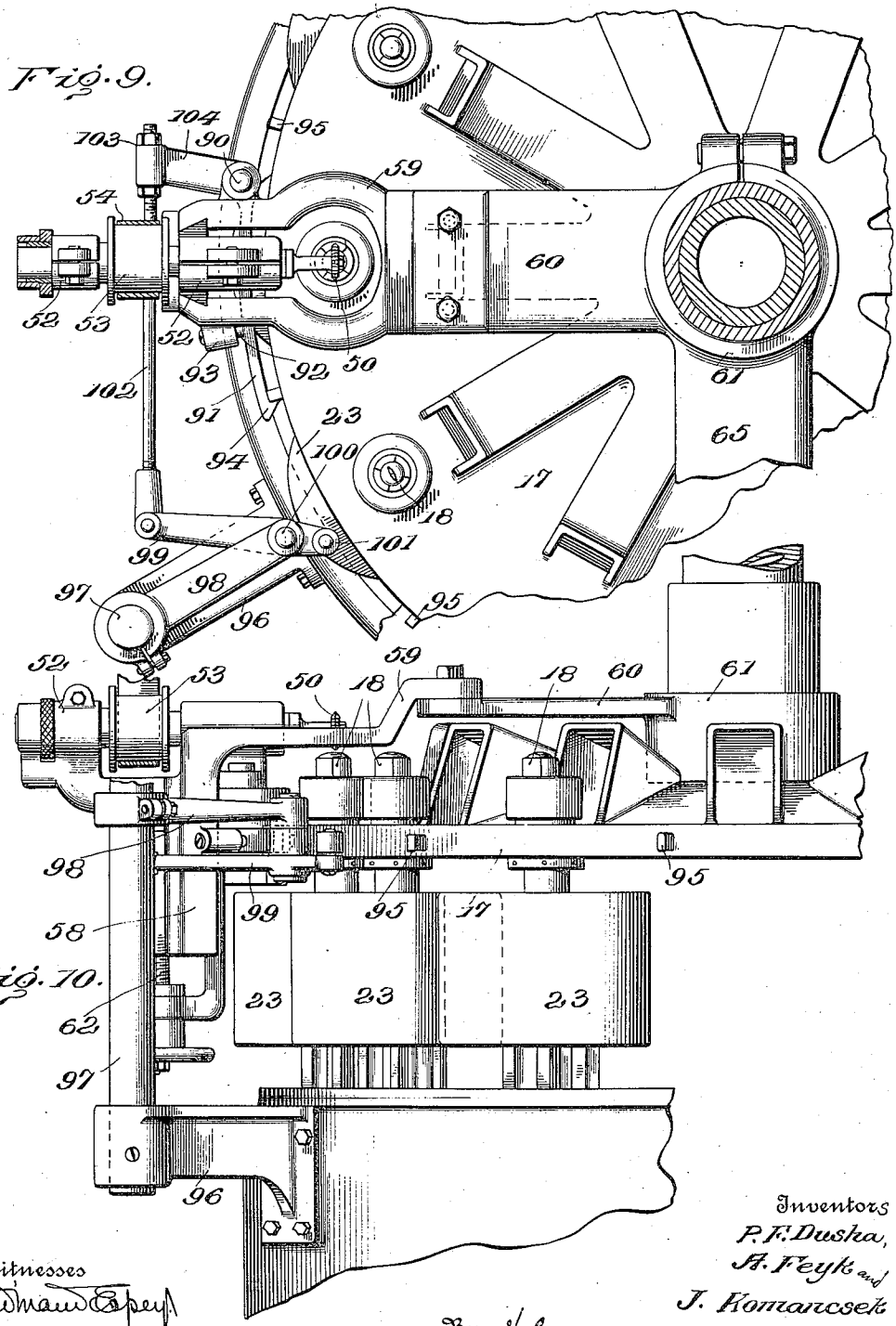


Fig. 10.

Witnesses

Inventors

P. F. Dusha,

A. Feyk and

J. Komancsek

By

Attorney.

UNITED STATES PATENT OFFICE.

PAUL F. DUSHA, ANTON FEYK, AND JOSEPH KOMANCSEK, OF NEW YORK, N. Y., ASSIGNORS TO HOLUB-DUSHA COMPANY, OF NEW YORK, N. Y.

BUTTON-MAKING MACHINE.

1,077,337. Specification of Letters Patent. Patented Nov. 4, 1913.

Application filed December 28, 1911. Serial No. 668,254.

To all whom it may concern:

Be it known that we, PAUL F. DUSHA, ANTON FEYK, and JOSEPH KOMANCSEK, citizens of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Button-Making Machines, of which the following is a specification.

This invention comprehends certain new and useful improvements in machines for making buttons, and relates particularly to improvements in the machine embodied in our copending application for Letters Patent of the United States, Serial No. 668,252, filed the 28th day of December, 1911.

The machine of the application just mentioned includes, among other features, means whereby the same machine, regarded from a commercial or trade standpoint, may be used for facing and drilling blanks with four thread receiving openings, and means whereby, after a certain adjustment of the parts, buttons of the fish eye type may be formed, in which latter event the blanks are not turned four successive quarter turns, one quarter turn after each drilling operation, but are turned two quarter turns after the first drilling operation and before a second drilling operation, two of the four drills embodied in the machine remaining inactive.

The present invention has for its primary object improved means whereby, upon the removal of the four drills of the machine above mentioned, and the substitution therefor of an attachment which forms one of the main features of the present invention, the machine will be equipped with only two drills and with means whereby, after the fish eye has been formed in the blank, the latter may be quickly and accurately formed with the two usual thread receiving openings disposed in diametrical relation to each other.

The invention also has for its object a machine of this character embodying an improved arrangement of drills, whereby said drills may be adjusted toward and from each other to regulate the distance between the two thread receiving holes that are formed thereby, and without adjusting or altering in any way the actuating mechanism of the drills or other parts of the machine. And the invention also aims to generally improve this class of devices and to render them more useful and commercially desirable.

With these and other objects in view, as will more fully appear as the description proceeds, the invention consists in certain constructions, arrangements and combinations of the parts that we shall hereinafter fully describe and claim.

For a full understanding of the invention, reference is to be had to the following description and accompanying drawings, in which:

Figure 1 is a side elevation of our machine arranged as hereinbefore indicated; Fig. 2 is a horizontal sectional view of a portion of the machine, the section being taken substantially on the line 2—2 of Fig. 1; Fig. 3 is a horizontal sectional view taken substantially on the line 3—3 of Fig. 1; Fig. 4 is a vertical transverse section on the line 4—4 of Fig. 3; Fig. 5 is a detail perspective view of some of the supporting devices for the grinder disk; Fig. 6 is an enlarged fragmentary plan view of the drilling attachment and subjacent portion of the chuck carrier; Fig. 7 is a perspective view of two buttons of the form preferably made by the present embodiment of the invention; Fig. 8 is an enlarged side elevation of the drilling attachment; Fig. 9 is a top plan view of the fish eye tool and its correlated parts; Fig. 10 is a side elevation thereof; and Fig. 11 is a detail view illustrating one of the blanks and a portion of the grinder disk for shaping and facing the same.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawing by the same reference characters.

The power to operate the machine may be supplied from any suitable source and is transmitted to the machine by a main shaft 1 provided with a clutch 2 and shipper lever 3 therefor, whereby it may be operatively connected to and disconnected from a shaft 4 carrying a spur pinion 5. The pinion 5 meshes with a spur pinion 6 secured to a stub shaft 7 on which is mounted a stepped pulley 8, and a driving belt 9 passes over the pulley 8 and around a corresponding pulley 10 on a countershaft 11. The shaft 11 is provided with a worm 12 engaged by a worm gear 13 on a vertically disposed spindle 14, said spindle carrying a pinion 15 which

meshes with an interiorly toothed ring 16 secured to a rotary chuck carrier 17.

18 designates the blank holding chucks of the machine, of which there are twelve arranged at equal distances apart in a circular series around the margin of the top portion of the table of the chuck carrier 17, although it is to be understood that the invention is not limited to this or any number of chucks. The chucks 18 are carried by vertically disposed rotatable spindles 19, the lower ends of which are mounted on and supported by vertically movable step bearings 20 provided at their lower ends with rollers 21 movable upon a circular cam track 22, whereby the chuck spindles and chucks may be raised automatically, as required, to bring the blanks carried by the chucks into operative relation to the fish eye forming and drilling tools.

In order to rotate the chuck spindles 19, each of them is provided with a pulley 23, the said pulleys being arranged, during one portion of the circular traverse of the series of chucks, to engage the circumferentially extending stretch 24 of a driving belt 25, said belt passing around idlers 26 and 27, and also around a driving pulley 28 secured to a vertically disposed shaft 29 journaled in the framework 30. The shaft 29 is driven by means of meshing beveled pinions 31, one of which is secured to said shaft and the other of which is secured to the main driving shaft 1, as best illustrated in Fig. 1.

While it is to be understood that the buttons may be faced or shaped before being placed in the machine as arranged according to the present invention, it is primarily intended that the present embodiment of the invention work upon the relatively less costly button blanks, and that the buttons be faced or shaped by grinding instead of facing tools such as disclosed in our copending application hereinbefore specifically referred to. To this end, we employ a grinder disk 32, which is secured to the lower end of a vertically disposed shaft 33 mounted to rotate in a bracket 34. This bracket is mounted for a vertical movement on the front face of a supporting and guiding member 35 and is vertically adjusted, in order to bring the disk 32 at the proper elevation for working on the blanks in the chucks, by means of a threaded adjusting rod 36, which is journaled in a boss or bearing 37 forming part of the bracket 34, and which works through an opening formed in the front portion of the supporting member 35. The member 35 is secured for a horizontal adjusting movement on a vertical portion of the main framework 30, as best illustrated in Figs. 1 and 2, the said horizontal adjustment of the member 35 and the disk 32 which is indirectly supported thereby, being effected by means of a rod 38 which is secured to the member 35 and to a slide 39 supported by angular bracket 40. The slide 39 is adjusted longitudinally on the bracket 40 by means of a screw rod 38 manipulated by a hand wheel 41. In order to rotate the disk 32, the shaft 33 thereof carries a pulley 42 around which a driving belt 43 passes, said belt also passing around idlers 44 and around a main driving wheel 45 secured to the main driving shaft 1, as clearly illustrated in Fig. 1.

The facing grinder 32 is located substantially centrally above the main driving shaft 1, and it will thus be understood that after the blanks are fed into the chucks 18, as by an automatic feeding device 46 forming the subject-matter of another copending application, filed the 25th day of November, 1911; Serial No. 662,495, said blanks will be carried around in the chucks as the chuck carrier 17 revolves about its center axis, and the chucks will be rotated and will be successively brought into engagement with the facing or shaping grinder 32, the latter also rotating in a direction reverse to the rotation of the chucks, and the blanks being thereby properly faced or shaped.

In the continued revoluble movement of the chuck carrier 17, the pulleys 23 will pass out of operative engagement with the stretch 24 of the driving belt 25 immediately after leaving the idler 27, and at this time spring latches 47 carried by the chuck carrier 17 will be permitted to be automatically brought by their springs 48 into engagement with keeper blocks 49 secured to and movable with the spindles 19, whereupon the chucks will be brought to a standstill as regards their independent rotary movement, and will, in the continued revoluble movement of the carrier 17, be brought under a fish eye forming tool 50, at which time the rollers 21 will ride upon a relatively high portion of the cam track 22 so as to bring the blanks in the chucks up into engagement with the tool 50 so as to perform the operation of forming the fish eye in the blank.

The fish eye tool 50 is secured to the inner end of a radially disposed longitudinally adjustable shaft 51 which is mounted in bearings 52 and which is provided with a pulley 53 around which a driving belt 54 passes, said belt also passing around idlers 55 (see Fig. 1) and around a driving pulley 56 secured to the upper end of the shaft 29 before mentioned. By this means, the fish eye forming tool 50 is continuously rotated.

The bearings 52 for the tool supporting shaft 51 are formed on the upper end of a vertically disposed supporting arm 57 mounted for a vertically adjustable movement on the depending vertical portion 58 of an angular bracket 59 which is secured by stud bolts or similar fastening devices, to an arm 60 which projects upwardly from a

casting 61 movable independently of the chuck carrier 17 and mounted to oscillate in a horizontal plane about the same vertical axis about which the chuck carrier 17 is mounted to turn. In order to secure the proper vertical adjustment of the fish eye forming tool 50, the supporting arm 57 rests at its lower end upon an adjusting screw 62 which works in an apertured ear 63 projecting laterally from the lower extremity of the depending portion 58 of the bracket 59. The parts just named may be guided in a definite plane relative to the chuck carrier 17 in any desired way, as, for instance, by guiding rollers 64 carried by the depending portion of the bracket 59 and engaging with the upper and lower surfaces of the top portion of the chuck carrier 17, at the rim thereof. The casting 61 is also provided, in addition to the arm 60, with an arm 65 which in the present embodiment of the invention is extended radially in right angular relation to the arm 60, the said arm 65 supporting and carrying the drilling attachment of the machine arranged to form two diametrically opposite thread receiving holes in the blanks after they have been acted upon by the fish eye forming tool 50. Said attachment includes a horizontally disposed supporting bracket 66 resting upon the arm 65 and secured thereto by stud bolts 67 or similar fastening devices, said bracket being provided with a downwardly projecting outer end 68 having guiding rollers 69 engaging the upper and lower faces of the chuck carrier 17 in a manner similar to the guiding rollers 64 before mentioned. Supported upon the bracket 66 are horizontally disposed arms 70, two in number, pivotally mounted at their inner ends upon a pivot stud 71, projecting upwardly from the bracket 66 at the inner end of the latter. Each of these arms 70 carries a tool holder 72, in which a vertically disposed shaft 73 is journaled to rotate about its longitudinal axis, and each of said shafts carries at its lower end a drilling tool 74. The shafts 73 are rotated by means of pulleys 75 secured thereto, a driving cable 76 passing around said pulleys and around an idler 77 mounted on the post 78 rising from the bracket 66, said post being provided with diverging arms 79 carrying idlers 80 around which the outermost stretches of the belt or cable 76 pass, whence said stretches extend around idlers 81 supported by the framework 30, as best illustrated in Fig. 1. The cable 76 receives its motion from the same driving pulley 56 which runs the belt 54 that drives the fish eye forming tool 50.

It is one of the objects of our present invention, as set forth at the outset of the specification, to provide means whereby the drilling tools 74 may be adjusted to vary the distance between them, and consequently vary, as required, the distance between the thread receiving holes formed in the fish eye of the blank. To accomplish this, the arms 70 are pivotally mounted at their inner ends, as at 71, and each arm is provided with a threaded lug 82, said lugs being interiorly threaded in opposite directions for engagement by the right and left hand threads of an adjusting spindle 83. This spindle is provided with a milled finger piece 84, and carries a ratchet 85 engaged by a spring pawl 86 secured to one of the arms 70 whereby, when the said spindle is turned and the required adjustment effected between the arms 70, the desired adjustment may be maintained and all accidental shifting avoided. To accommodate these movements of the arms 70, as regards the fastening devices 67, each arm is formed with a slot 87, as best illustrated in Fig. 6. If desired, each arm may be further formed with an outer slot 88, accommodating a guiding stud 89 projecting upwardly from the bracket 66.

The machine is so designed that the fish eye forming tool 50 and the drills 74 will be carried along with the chuck carrier 17 a predetermined distance, and at the same speed as the chuck carrier is traveling. The means for effecting this result comprises a stud 90 carried by one side of the bracket 59, and a latch arm 91 which is pivoted at one end of the stud 90 and which is forced inwardly by a spring pressed pin 92 mounted in a hollow boss 93 formed on the bracket 59. The relatively free end of the latch arm 91 is formed with a beveled hook 94 designed for intermittent engagement by a series of pins 95 projecting radially outward from the edge of the chuck carrier 17. As the chuck carrier revolves, the hooked latch 91 will be engaged by one of the pins 95, whereby the arms 60 and 65 will be carried forward with the chuck carrier 17 and at the same rate of speed, while during such movement the chucks will be raised upwardly and one blank will be operated upon by the fish eye forming tool 50 while the next preceding blank will be operated upon by one of the drills 74 to have its first thread receiving hole formed therein, and at the same time the blank in advance of the last named blank will be operated upon by the other drilling tool to have the second thread receiving hole formed therein.

When these operations of forming a fish eye blank and drilling two preceding blanks in the series have been completed, the fish eye forming tool and the drilling tools are automatically moved back one step to catch up with the succeeding blank, the reverse movement being very much quicker than the advancing movement described, and being accomplished by the following instrumentalities: A supporting bracket 96 has secured to its outer end an upwardly pro-

jecting post 97 to the upper end of which there is secured an inwardly extending arm 98 to which a lever 99 is pivotally connected intermediate of its ends, as at 100. The inwardly projecting arm of said lever 99 carries a roller 101, and a link rod 102 is connected to the outer and longer arm of said lever, said link rod being also adjustably connected as at 103 to a bar 104 mounted on the stud 90. As the latch 91, engaged by one of the pins 95, comes into engagement with the roller 101, said roller will pass back of the beveled extremity 94 of said latch and disengage the latter from the pin, and immediately thereafter the roller will be struck by the pin and the lever 99 will be rocked in a direction whereby, owing to the length of the outwardly projecting arm of said lever relative to the inner arm thereof, the arms 60 and 65 will be quickly brought back to their initial positions ready for the succeeding operation and movement forward with the table or chuck carrier 17, when the latch 91 is engaged by the oncoming pin.

From the foregoing description in connection with the accompanying drawings, the operation of this embodiment of our improved button forming machine will be apparent, the detail operation of the various elements being described coincident with their construction and relative arrangement. Suffice it to say, that in the practical use of the machine, the blanks to be worked upon will be fed into the chucks and carried thereby, while the chucks are rotating, underneath the rotating grinder 32, whereby the blanks will be faced or shaped, and subsequently, in the continued revolution of the chuck carrier 17, the blanks will be brought successively underneath the fish eye forming tool. As a blank reaches the fish eye forming tool 50, it is caused to engage therewith and the tool moves forwardly with the blank while the tool is rotating to form the fish eye. At the completion of such operation, the fish eye tool moves back to its original position, while the blank continues to move in the same direction in the chuck, thus bringing it beneath the first drilling tool. The next succeeding blank in the series will be acted upon by the fish eye forming tool while the blank first mentioned will have its first button receiving hole drilled therein, and in the next succeeding turn will reach the second of the drilling tools 74 and have the second thread receiving hole formed therein. In order to vary the distance between the two button receiving openings, the arms 70 are made adjustable, whereby the tool holders 72 may be spread apart or brought nearer together by manipulating the adjusting spindle 83.

While the accompanying drawings disclose what we believe to be the preferred embodiment of our invention, it is to be understood that the invention is not limited thereto, but that various changes may be made in the construction, arrangement and proportions of the parts within the scope of the claims.

Having thus described our invention, what is claimed is:

1. A button forming machine including a movable chuck carrier, button chucks carried thereby, a tool carrier movable with the chuck carrier for a predetermined distance and including diverging arms having a common pivot, means for adjusting said arms with relation to each other to change their angular distance, and tools mounted, one upon each of the arms and adjustable with said arms toward and from each other.

2. A button forming machine including a movable chuck carrier, chucks carried thereby, an arm mounted for movement independent of the chuck carrier, a fish-eye forming tool mounted upon said arm, a second arm movable with the first arm but extending angularly therefrom, and comprising sections having a common pivot and means for adjusting said sections with relation to each other to change their angular distance, drills mounted, one upon each section and adjustable with the sections toward and from each other, and means for moving said arms with the chuck carrier for a predetermined period and for subsequently returning said arms to their initial position.

3. A button forming machine, including a movable chuck carrier, chucks carried thereby, a movable arm, a bracket secured to said arm, arms pivotally mounted upon a common center and carried by said bracket, means for adjusting said last named arms toward and away from each other, drills carried by said last named arms, and means for automatically moving the first named arm with the chuck carrier for a predetermined distance and for subsequently returning said arms to its initial position.

4. A button forming machine, including a movable chuck carrier, chucks carried thereby, an arm movable with the chuck carrier for a predetermined distance and subsequently automatically movable in the opposite direction independently of the chuck carrier, a bracket secured to said arm, pivoted arms mounted on said bracket, tool holders carried by said last named arms, the said arms being formed with apertured lugs, and a right and left hand adjusting screw working through said lugs and arranged to move the last named arms toward and away from each other.

5. A button forming machine including a movable button carrier, a tool supporting member movable in a parallel path to the button carrier, a device carried by said supporting member and engaging the but-

ton carrier to cause a simultaneous movement in the same direction of the button carrier and said tool support, and means actuated by the button carrier for shifting said tool supporting member in a direction reverse to the movement of the button carrier after the button carrier and tool supporting member have moved together for a predetermined distance.

6. A button forming machine including a rotatable button carrier, a rotatable tool supporting member independently mounted upon the same axial center as the button carrier and movable in a parallel path to the carrier, means mounted on the button carrier adapted to operatively engage the tool holder to cause a simultaneous movement in the same direction of the tool holder and tool carrier, and means disposed in the path of movement of the means on the carrier for disengaging the tool supporting member from the button carrier and shifting said tool support in a direction reverse to the movement of the button carrier after the button carrier and tool supporting member have moved together for a predetermined distance.

7. A button forming machine including a movable button carrier, a tool supporting member movable in a parallel path to the button carrier, a latch carried by the tool supporting member and adapted to engage the button carrier to cause a corresponding movement of the tool supporting member and the carrier in one direction, and means for disengaging said latch and returning the tool supporting member to its initial position after the button carrier and tool supporting member have moved together a predetermined distance.

8. A button forming machine including a movable button carrier having outwardly projecting spaced lugs, a tool supporting member movable in a parallel path to the button carrier, a catch on the tool supporting member adapted to engage one of said projections, a pivoted tripping member mounted in the path of movement of the catch and said projection, said tripping member being operatively engaged with the tool supporting member, whereby said tripping member will engage the catch to disengage it from the lug, and will be engaged by the lug and rotated thereby to cause a reverse movement of the tool supporting member.

9. A button forming machine including a rotatable button carrier, a tool supporting member mounted for rotation in a parallel path to the carrier, a lug projecting from the carrier, a catch mounted upon the tool supporting member and adapted to engage over the lug, a pivoted arm projecting from the tool supporting member, a fixed arm mounted adjacent to the periphery of the button carrier, a lever pivoted at the extremity of the fixed arm and having a roller at its inner end adapted to engage the extremity of the catch to release the same from its engagement with the lug and to be engaged by said lug and thereby rotated upon its pivot, and a link connecting the outer end of said lever with the outer end of the first named arm.

10. A button forming machine including a rotatable button carrier, a tool supporting arm mounted upon the same axis as the carrier and extending beyond the same, a plurality of spaced lugs projecting from the periphery of the carrier, a hook-shaped latch mounted upon the tool supporting arm and adapted to engage any one of said lugs and having a beveled extremity, an arm pivoted upon and projecting from the tool supporting member, a lever pivotally mounted adjacent to the periphery of the carrier, the inner end of the lever lying in the path of movement of the beveled end of the catch and of said lug, the other end of the lever having a link connection with the said pivoted arm, whereby the catch shall be lifted from its engagement with the arm upon coming in contact with said lever, and a lug adapted to engage said lever to rotate the same to shift the tool supporting member rearwardly.

11. A button forming machine including a rotatable button carrier, a tool supporting member movable in a parallel path to the button carrier, means mounted on the tool supporting member and adapted to engage the carrier to cause a simultaneous movement of the carrier and the supporting member, and means operated by the carrier for releasing said engagement after the carrier and tool supporting member have moved a predetermined distance, said means also acting to return the tool supporting member to its original position.

12. In a button forming machine, a rotatable carrier, a tool supporting member mounted upon the same axis as the carrier but independently rotatable with relation to the carrier, oppositely disposed wheels mounted upon the tool supporting member and engaging the upper and lower faces of the carrier, and means for moving the tool supporting member a predetermined distance with the carrier and for returning the tool supporting member to its original position.

13. A button forming machine including in its organization a rotatable button carrier, an arm mounted upon the same axis as the carrier but independently rotatable, means for shifting the arm in coincidence with the carrier for a predetermined distance and then returning the arm to its initial position, diverging members pivoted upon said arm and forming a part thereof,

means for adjusting said members toward and from each other, tool carriers mounted one on each member and including vertically disposed spindles, pulleys one for each spindle, a pulley disposed at the meeting point of said members and mounted for horizontal rotation, a pair of pulleys mounted inward of the last named pulley and disposed in horizontally diverging planes, and an endless belt passing around the first named pulleys inward and around the second named pulley and beneath the last named pulleys, and driving means for said belt.

In testimony whereof we affix our signatures in presence of two witnesses.

PAUL F. DUSHA. [L. S.]
ANTON FEYK. [L. S.]
JOSEPH KOMANCSEK. [L. S.]

Witnesses:
VACHER LOUMISKEY,
FRANK SOVAK.