

Aug. 27, 1946.

W. J. DE WITT ET AL

2,406,456

FISHHOOK MAKING MACHINE

Filed June 29, 1944

3 Sheets-Sheet 1

Fig. 1.

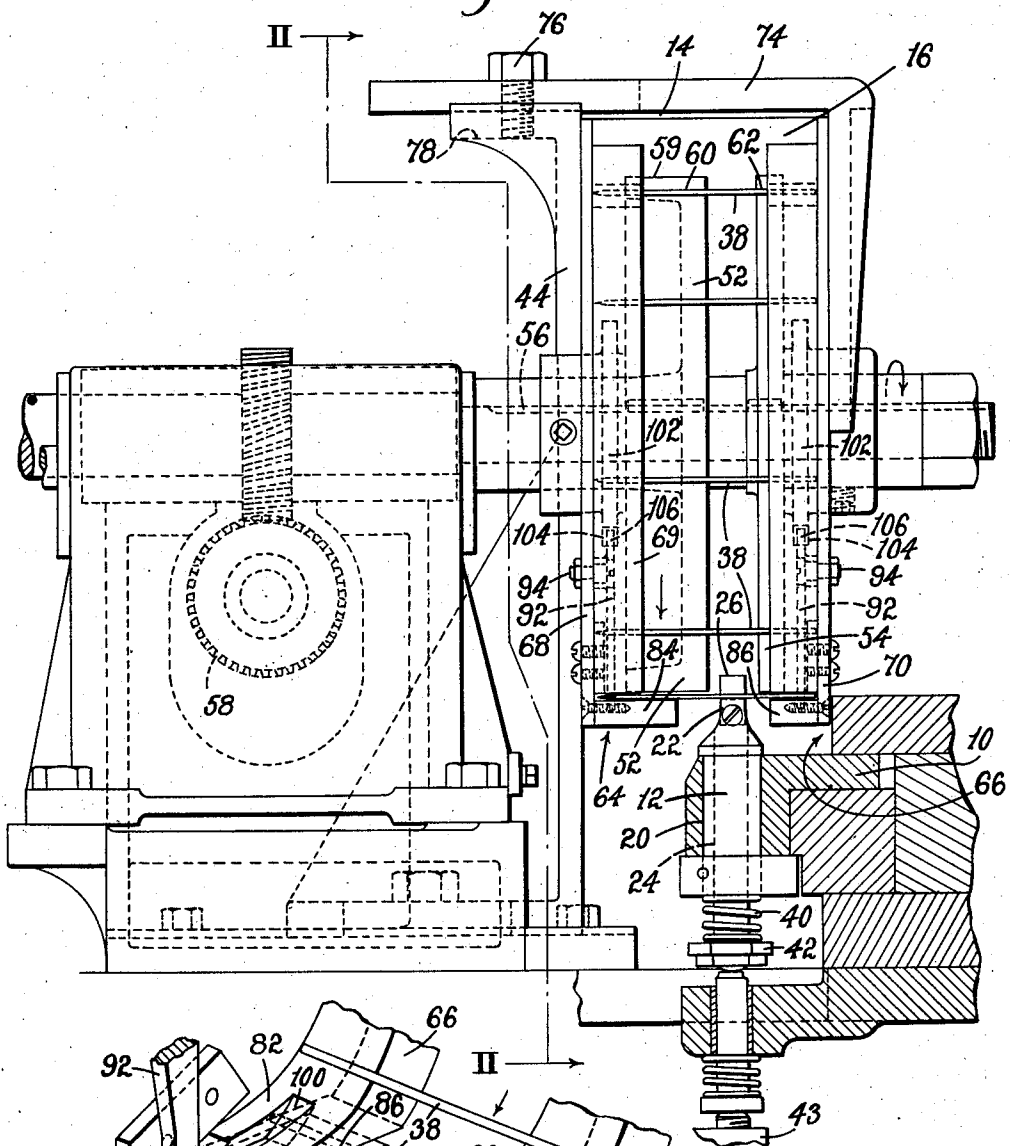
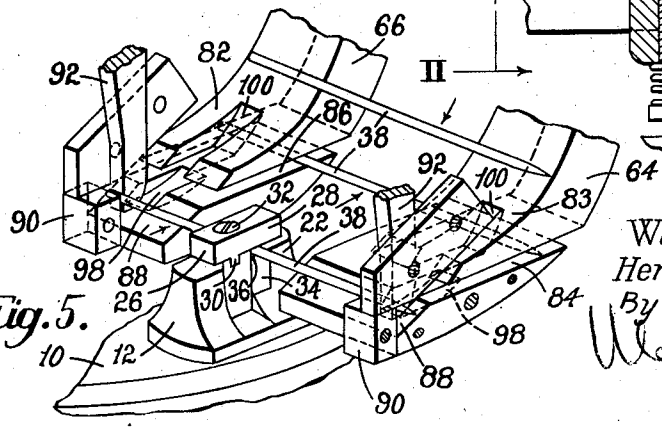


Fig. 5.



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Fig. 2.

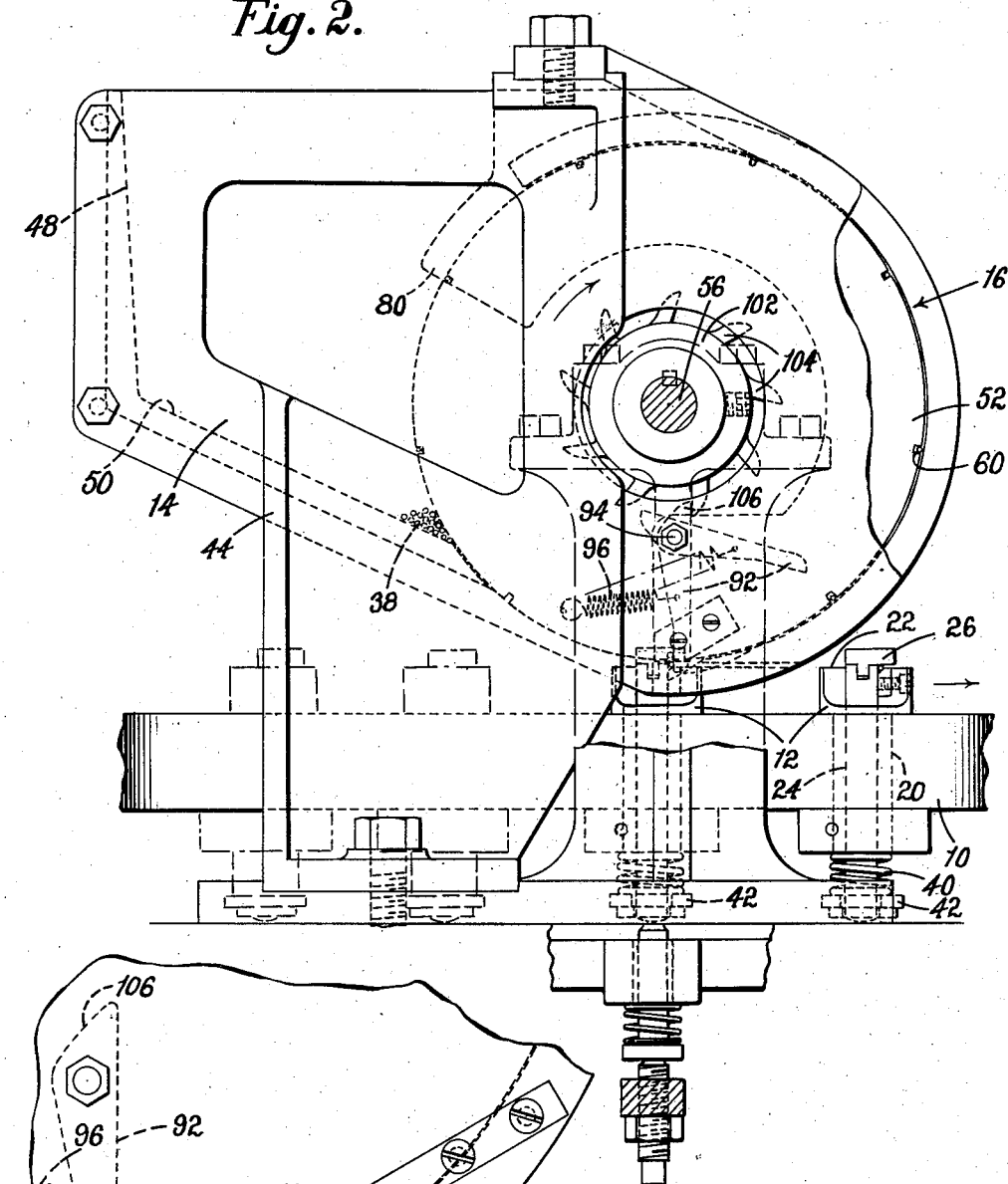
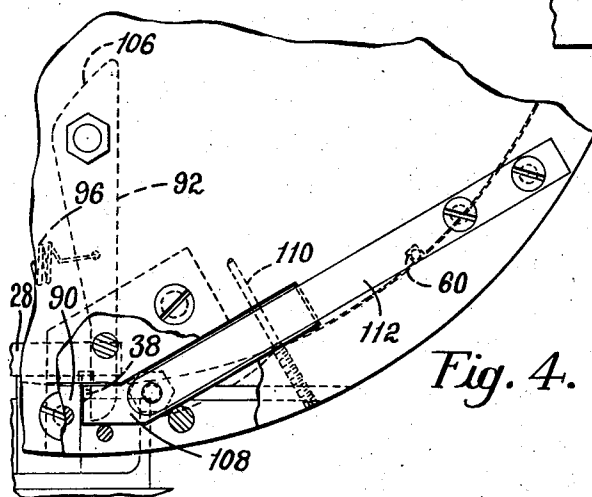


Fig. 4.

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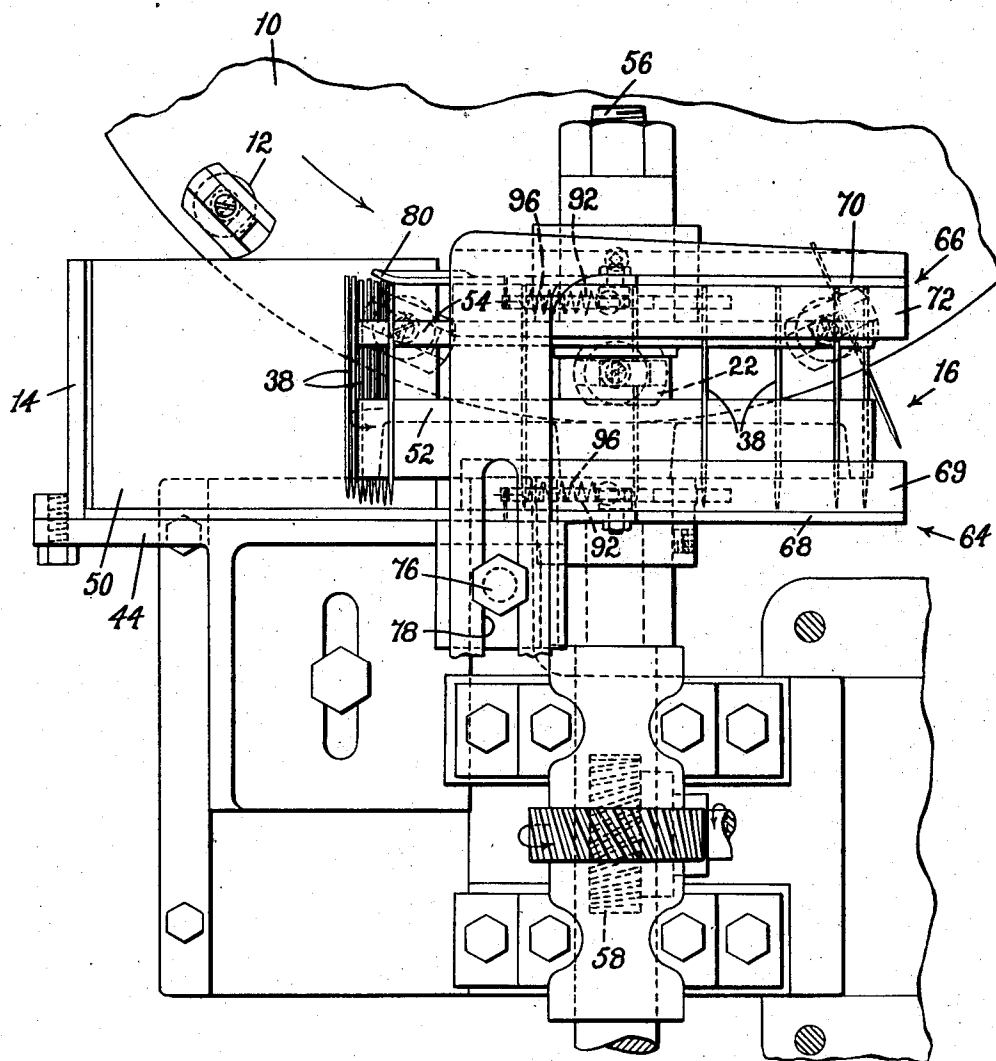
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3 Sheets-Sheet 3

Fig. 3.



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2,406,456

FISHHOOK MAKING MACHINE

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Application June 29, 1944, Serial No. 542,710

10 Claims. (Cl. 29—9)

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This invention relates to machines for operating upon wire blanks, and is herein illustrated as embodied in an automatic fishhook making machine of the type disclosed in application for United States Letters Patent Serial No. 451,792, filed July 21, 1942, now Patent No. 2,379,886, granted July 10, 1945, in the names of William J. De Witt, Ernest L. Ott and William B. Runk.

It is an object of the invention to provide improved mechanism for feeding wire blanks, such as fishhook blanks, to the work holders of a forming machine, in such a manner that the blanks will be accurately positioned in the holders so that they can readily be presented in predetermined position to instrumentalities for carrying out the forming operations. To this end and as illustrated, the invention provides in a machine of the type referred to a rotatable turret having positioned thereon a plurality of work holders, a magazine for fishhook blanks, feed mechanism for moving blanks from the magazine one at a time to the work holders in a direction opposite to the movement of the holders, together with mechanism for positioning each blank in predetermined relation to the holder and securing it in fixed position therein. This mechanism is advantageous in that, since the blanks are accurately located relatively to the holders, the presentation of the blanks to various operating instrumentalities is closely controlled. This avoids any likelihood of damaging blanks due to improper location of the ends of the blanks to operating tools, such as dies for performing an eyeing operation, or a chisel for forming a barb.

These and other features of the invention are described in the following specification, are shown in the accompanying drawings, and are pointed out in the claims.

In the drawings,

Fig. 1 is a front elevation of a portion of a fishhook making machine, showing the relation of the feeding mechanism to the turret;

Fig. 2 is a vertical sectional view taken along line II—II of Fig. 1;

Fig. 3 is a plan view of the feeding mechanism and a portion of the turret;

Fig. 4 is a side view on an enlarged scale showing mechanism for locating blanks relative to work holders; and

Fig. 5 is a perspective view of a portion of the turret with a work holder, together with mechanism for positioning the blank relatively to the holder.

The machine comprises a rotatable turret 10

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carrying a plurality of work holders or chucks 12, a magazine 14 for fishhook blanks, and a drum 16 for moving blanks one at a time to the work holders.

The turret 10 is mounted upon a portion of the frame 18 of the machine, and is arranged to be rotated successively to present the work holders to various operating instrumentalities (not shown) arranged about the periphery of the turret. For further details of construction and operation of the turret, reference may be had to the aforementioned application.

Each of the work holders or chucks 12 comprises a sleeve 20, Figs. 1, 2 and 5, carrying at its upper end a stationary clamping jaw 22, there being a spindle 24 extending through the sleeve and terminating in a movable clamping jaw 26. The operating portion of the movable clamping jaw comprises a laterally projecting plate 28 having a portion 30, received in a slot in the upper end of the spindle, for maintaining the plate in predetermined position, and a screw 32 for securing it to the spindle. The purpose of this is to facilitate the replacement of the plate when it becomes worn. The stationary jaw 22 has an inset portion 34, which is beveled, as shown at 36, adjacent to the spindle, to receive a wire fishhook blank, such as a blank 38, to position the blank horizontally and to hold it in such position when the movable clamping jaw is pressed down upon the blank. The movable jaw 28 is normally forced downwardly toward the stationary jaw by means of a spring 40 surrounding the lower end of the spindle and resting upon a washer 42. This spring normally urges the spindle and the movable jaw downwardly to force the two jaws into engagement, and, when a blank is positioned between the jaws, firmly to grip it with the blank resting in the recess 34. In order to open the jaws to permit the insertion of a blank, there is provided a lever 43 arranged to be operated automatically, when the turret is in position with a work holder adjacent to the drum 16, to force the spindle upwardly, thus to raise the upper jaw a sufficient distance to permit insertion of a blank.

The magazine 14 is carried by an upstanding bracket 44, mounted on the frame of the machine, and comprises an upwardly extending rear wall 46, and a downwardly inclined bottom plate 50. Wire fishhook blanks, such as blanks 38, can be stacked in the hopper and gravity will operate to urge them downwardly along the inclined bottom of the hopper into engagement with the periphery of the drum 16.

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Mechanism is provided for moving the blanks one at a time into position to be advanced to work holders 12 upon the turret. This mechanism includes the drum 16, which comprises two circular disks 52 and 54 which are keyed to a rotary shaft 56 arranged to be driven by a gear 58. The disks extend into the magazine 14 with their peripheries close to the lower end of the inclined bottom plate 50, so as to support the blanks, the disk 52 having a wide flange 59 for that purpose. The disks are spaced apart upon opposite sides of the path of movement of the work holders 12 on the turret, so that the work holders may pass through the drum in receiving blanks therefrom. The disks forming the drum are provided along their peripheries with pairs of aligned grooves 60 and 62 adapted successively to engage and to pick up the lowermost of the blanks positioned within the magazine. Rotation of the drum results in shifting the blanks through an angular distance of about 300° to move them into position to be fed to work holders.

In order to maintain the blanks in position in the grooves during this movement, there are provided two curved guide plates 64 and 66 extending close to the outer surfaces of the disks 52 and 54 throughout considerable portions of their peripheries. The guide plate 64 is secured to the bracket 44 and has a vertical wall 68 extending along the outer face of the disk 52 and a horizontal flange 69 extending along the flange 59 of the disk. The guide plate 66 is similarly shaped, having a vertical wall 70 and a flange 72. The plate 66 is supported to extend along the outer side of the disk 54 by means of an arm 74 mounted upon the upper end of the bracket 44 and secured in fixed position of adjustment laterally of the bracket by a bolt 76 extending through an elongated slot 78 in the arm. The vertical wall 70 of the guide plate 66 has at its upper inner end an outwardly curved part 80, Figs. 2 and 3, which acts as a preliminary positioning member to force blanks, located in the grooves 60 and 62, toward the vertical wall 68 of the guide 64, so that blanks which may have been unevenly stacked in the hopper can be readily moved along the guide plates in advancing the blanks toward the work supports.

The lower ends of the guide plates 64 and 66 are curved outwardly away from the peripheries of the disks 52 and 54, and constitute platforms 82 and 83 for receiving each blank as it drops by gravity from the grooves 60, 62. There are two horizontal plates 84 and 86, secured respectively to the guide plates 64 and 66, across which the blanks are advanced from the platform 82. The plates 84 and 86 are provided with beveled surfaces 88 which terminate in abutments 90 for determining the position of each blank along the path of movement of the work holders at the time of presentation of the blank to a holder. It is to be noted that the platforms 82 and 83 are spaced above the plates 84 and 86 by a sufficient distance to permit the passage of a blank beneath the platforms after it has been positioned in a work holder.

In order to feed the blanks into position between the jaws, there are provided two feed fingers 92 loosely mounted upon pivots 94 on the guide plates 64 and 66, respectively. The fingers are normally urged by springs 96 in a direction opposite to the direction of movement of the work holders between the platforms. Portions of the plates and the platforms are cut away, respectively, at 98 and 100 to permit rearward

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movement of the fingers when they are retracted to permit a blank to be advanced toward the abutments 90. The fingers are retracted by means of cam wheels 102 mounted upon the shaft 56 and having spaced teeth 104 adapted successively to engage nose portions 106 on the feed fingers. Thus, as the shaft is rotated, blanks are successively picked up in the grooves 64 and 66 from the hopper and rotated into position where they drop by gravity from their grooves onto the platforms 82 and 83. The timing of the mechanism is such that, as the associated grooves in the plates 64 and 66 approach the platforms 82 and 83, the teeth 104 operate to retract the feed fingers to permit passage of a blank. Shortly afterwards the nose portions 106 of the fingers are released from the teeth, and the springs 96 force the feed fingers downwardly to engage the blank and move it into engagement with the abutments 90 in alignment with the open jaws of a work holder then in position to receive a blank. As the work holder with a blank therein moves past the platforms, the pressure of the blank upon the fingers causes them to retract slightly against pressure of the springs until the feed fingers disengage themselves from the blank which is then carried by the work holder through the passage between the plates and the platforms, and is advanced to an operating station (not shown).

In presenting blanks to operating instrumentalities, it is important that each blank project by a predetermined distance laterally from the line of feed thereof, in order that uniform location of successive blanks, relative to the operating mechanism, can be obtained. To accomplish this, there is provided a blank positioning device comprising a finger 108, Fig. 4, located adjacent to the platforms along the path of movement of the outer ends of the blanks. The finger is pivoted upon a pin 110 carried by the guide plate 54. The finger is forced inwardly against the ends of the blanks, as they pass by it, by means of a leaf spring 112 which moves the blanks laterally until their pointed ends engage the vertical wall 68 of the guide plate 64, thus locating them with the pointed ends in predetermined position transversely of the path of movement of the work supports.

In the operation of the machine, pointed fish-hook blanks are placed in the hopper 14 with their pointed ends disposed away from the axis of the turret 10. The drum 16, by means of the grooves 60, successively picks up blanks from the magazine and rotates them through an angle of about 300°, the blanks being retained in the grooves during their downward movement by the guide plates 64 and 66. Shortly after the blanks are picked up by the drum, they are shifted laterally by means of the member 80, which serves to direct them into the space between the guide plates. As each blank approaches the end of its movement with the drum, it is positioned in definite relation laterally to the path of movement of the work holders 12 by the spring-pressed finger 108, after which the blank drops upon the platforms 82 and 83, and is forced against the abutments 90 by the spring pressed fingers 92 which locate the blank in alignment with the jaws of a work holder. When a work holder with open jaws passes between the platforms, the fingers 92 yieldingly force the blank between the jaws to locate it in the pocket formed by the bevel 36 in the lower jaw, and the fingers retain control of the blank to hold it in fixed position until the lever 43 is re-

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leased, thus closing the jaws to clamp the blank in the holder in predetermined position for presentation to an operating instrumentality.

Having described our invention, what we claim as new and desire to secure by Letters Patent of the United States is:

1. A fishhook making machine comprising a rotatable turret, a plurality of chucks mounted upon the turret, stationary platforms extending upon opposite sides of the path of movement of the chucks, a magazine for holding fishhook blanks, a drum located adjacent to the platforms and to the magazine, grooves in the drum for receiving blanks from the magazine, means for rotating the drum to feed the blanks one at a time from the magazine to the platforms, and intermittently operated feed fingers for advancing each blank from the platforms to a chuck.

2. A fishhook making machine comprising a chuck, means for moving the chuck from one operating station to another, a magazine for fishhook blanks, stationary platforms extending upon opposite sides of the path of movement of the chuck, means for advancing blanks one at a time from the magazine to the platforms, and fingers for moving a blank from the platforms to a chuck.

3. A fishhook making machine comprising a work holder, means for moving the work holder from one operating station to another, stationary feed platforms located upon opposite sides of the path of movement of the work holder, a magazine for fishhook blanks, a drum for advancing blanks one at a time from the magazine to the platforms, and feed fingers for presenting a blank upon the platforms to the work holder.

4. In a fishhook making machine, a plurality of chucks, means for advancing the chucks successively past an operating instrumentality, a pair of platforms located upon opposite sides of the path of movement of the chucks, a magazine for fishhook blanks, a rotary drum for advancing blanks one at a time from the magazine to the platforms, spring-pressed fingers for advancing blanks one at a time from the platforms to the chucks, and means operable positively to retract the fingers prior to movement of each blank to the platforms.

5. A fishhook making machine comprising a plurality of spaced stationary platforms, a rotary drum adjacent to the platforms, a magazine for fishhook blanks adjacent to one side of the drum, a curved guideway partially surrounding the drum and extending to the platforms, grooves in the drum for receiving blanks from the magazine for advancing the blanks one at a time along the guideway to the platforms, a turret, work holding devices carried by the turret, means for advancing the work holding devices successively into position between the platforms, and means for presenting a blank on the platforms to a work holding device positioned between the platforms.

6. A machine for operating upon wire blanks comprising a plurality of work holders, each having blank clamping jaws, means for moving the work holders along a predetermined path, feed platforms located upon opposite sides of the path of movement of the work holders, blank locating abutments positioned adjacent to the platforms, an open-ended blank magazine located adjacent

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to the path, two spaced disks located upon opposite sides of the path adjacent to the magazine for feeding blanks one at a time from the magazine to the platforms, and spring pressed fingers for moving the blanks successively across the platforms into engagement with the abutments.

7. A machine for operating upon wire blanks comprising a work holder, means for moving the work holder along a predetermined path, feed platforms located upon opposite sides of the path of movement of the holder, blank locating abutments adjacent to the platforms, an open-ended magazine located adjacent to the path, two spaced disks located upon opposite sides of the path adjacent to the magazine, the disks being provided with alined grooves for receiving blanks from the magazine, means for rotating the disks to move blanks one at a time from the magazine to the platforms, spring pressed fingers for moving the blanks one at a time across the platforms into engagement with the abutments, and means operable to retract the fingers prior to movement of a blank to the platforms.

8. A machine for operating upon wire blanks comprising a magazine for blanks, a plurality of disks located adjacent to the magazine and having alined grooves in the peripheries thereof for receiving blanks from the magazine, two spaced platforms located adjacent to the disks, means for rotating the disks to advance the blanks one at a time from the magazine to the platforms, abutments adjacent to the platforms for locating a blank in a predetermined position, spring pressed fingers for moving a blank upon the platforms into engagement with the abutments, and a work holder mounted for movement between the disks to receive a blank located in position against the abutments.

9. A machine for operating upon wire blanks comprising a plurality of work holders, each having blank clamping jaws, means for moving the work holders in a predetermined path, blank receiving members positioned upon opposite sides of the path of movement of the work holders, stationary abutments for locating blanks in a predetermined position relatively to the path, means for feeding blanks one at a time to the blank receiving members, pivotally mounted feed fingers for advancing the blanks successively across the blank receiving members into engagement with the abutments, and means for retracting the fingers during movement of a blank to the blank receiving members.

10. A machine for operating upon wire blanks comprising a magazine, two spaced disks located adjacent to the magazine, said disks having alined grooves for receiving wire blanks from the magazine, a work holder having blank clamping jaws, means for moving the work holder along a path extending between the disks, blank receiving platforms located upon opposite sides of the path of movement of the work holder and in alinement with the jaws, means for rotating the disks successively to advance blanks from the magazine to the platforms, and yieldably mounted fingers for advancing a blank on the platforms in a direction toward the jaws of a work holder.

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