Feb. 14, 1933. C. E. NELSON 1,897,583

BLANK HANDLING APPARATUS

Filed Jan. 2, 1929

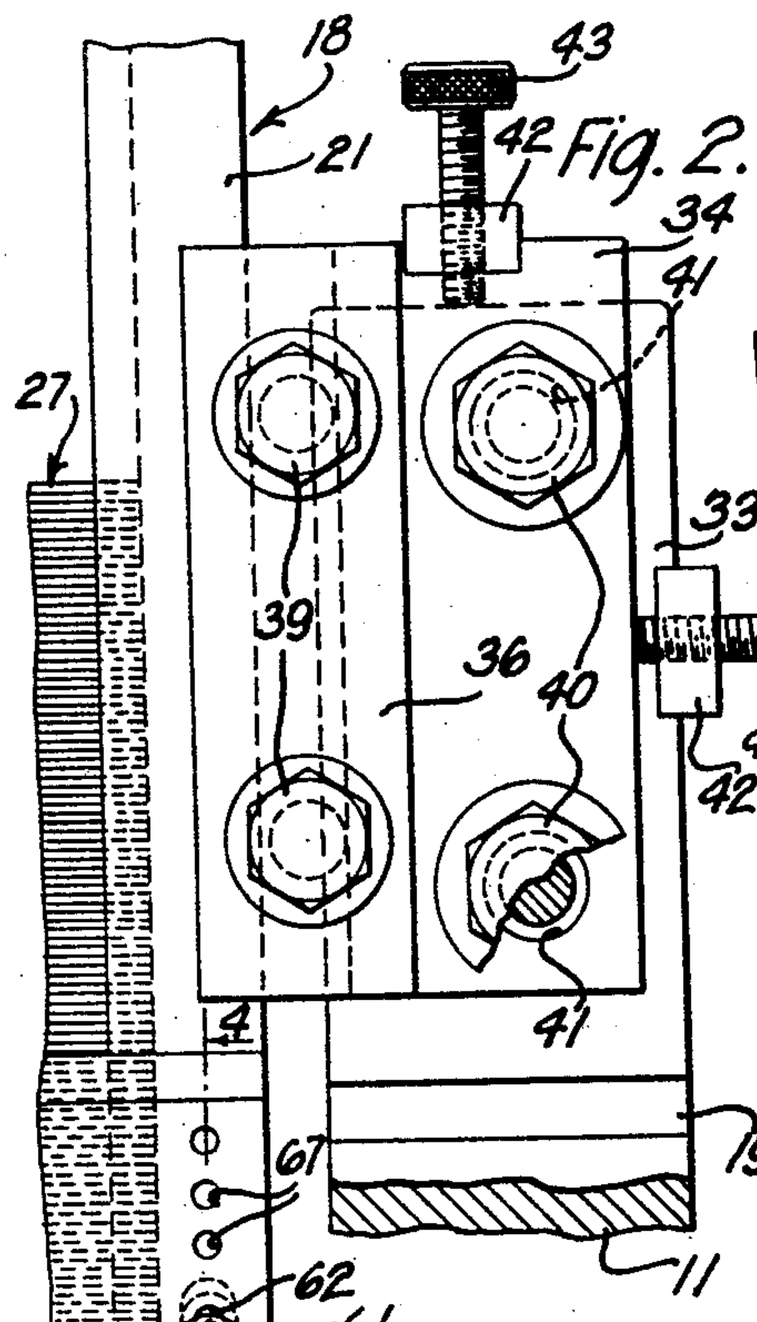

Fig. 2.

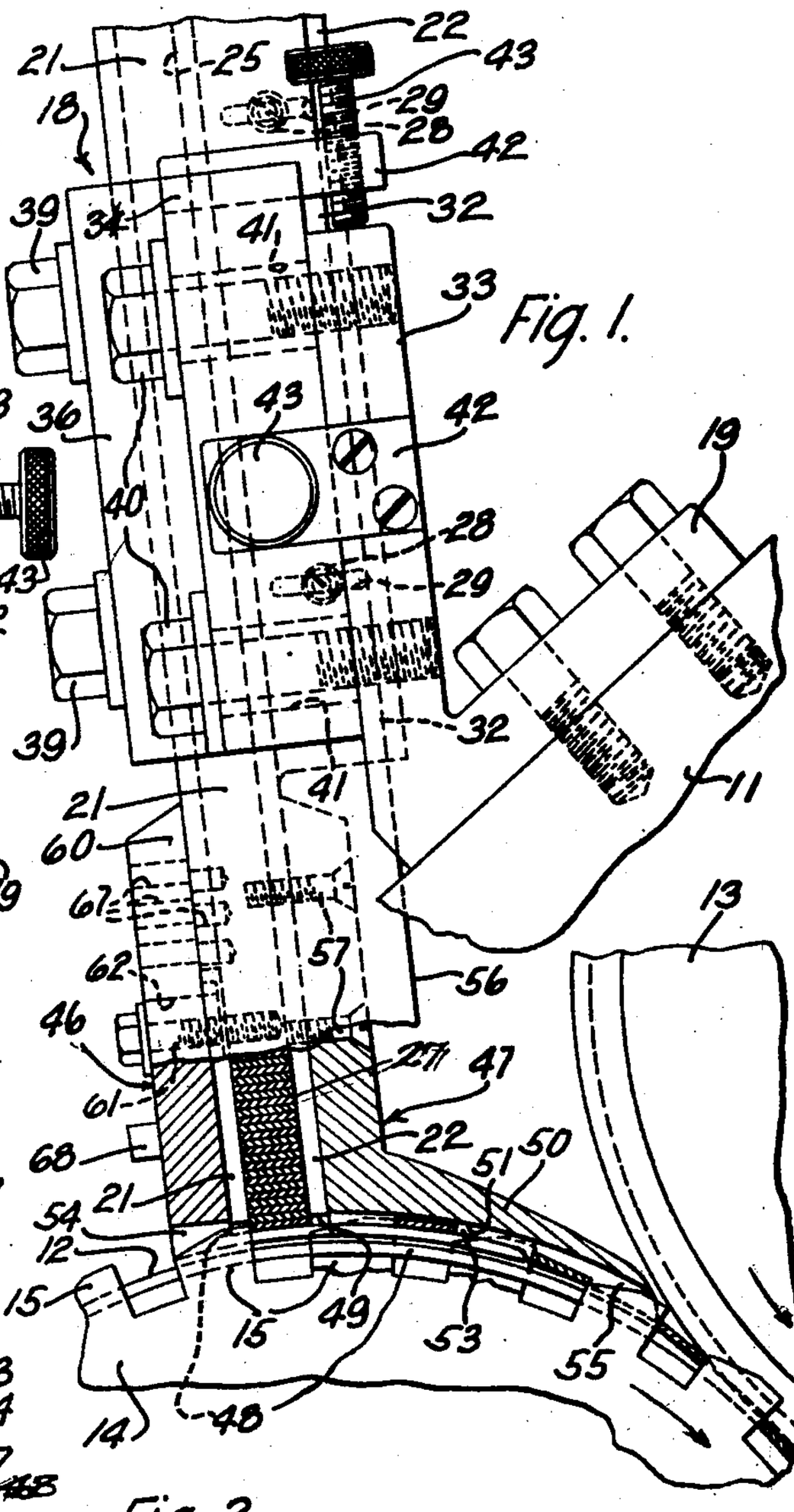

Fig. 1.

Fig. 4.

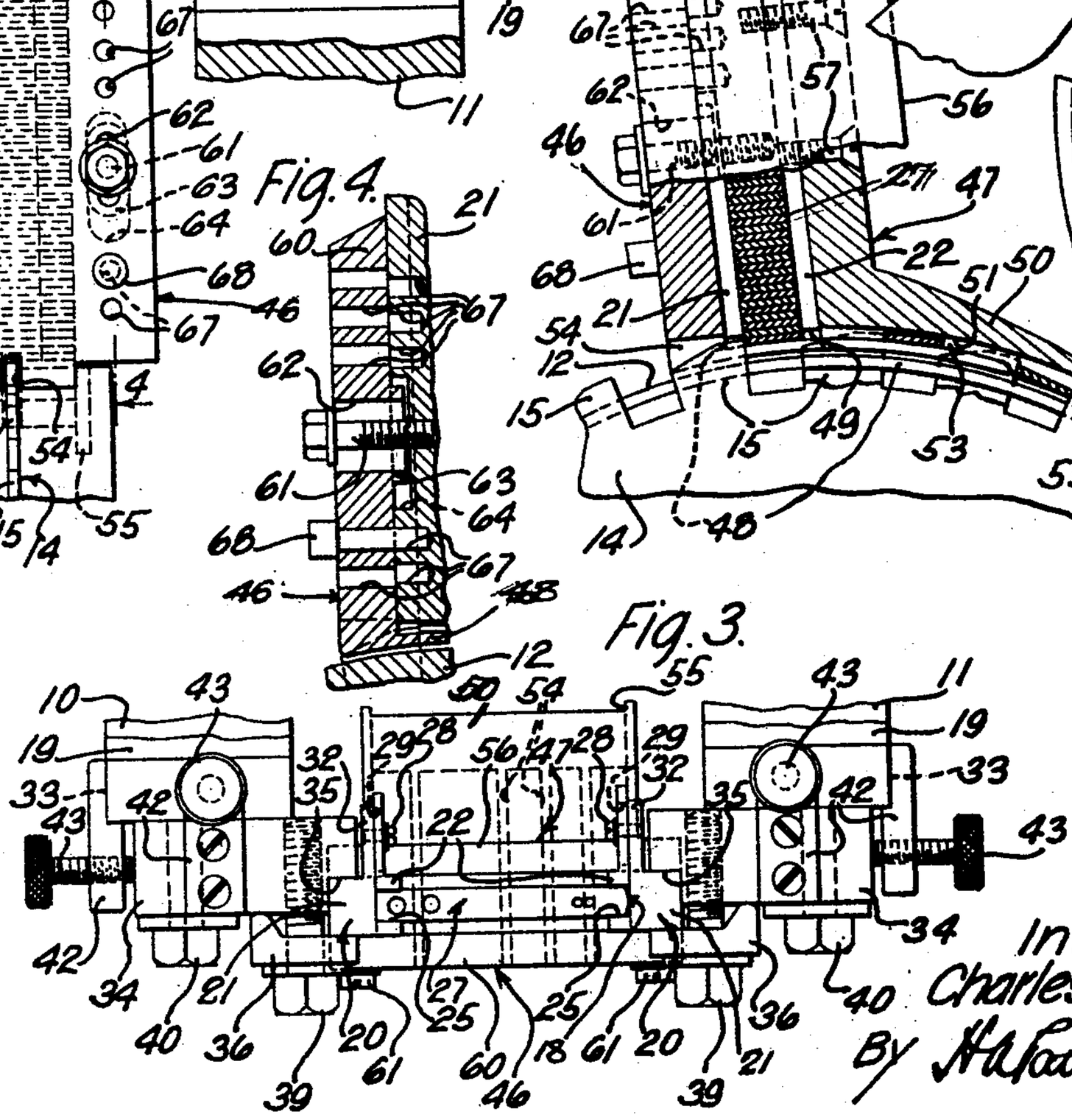

Fig. 3.

Inventor
Charles E. Nelson
By H. L. Fraser Atty.

Patented Feb. 14, 1933

1,897,583

UNITED STATES PATENT OFFICE

CHARLES EDWIN NELSON, OF CHICAGO, ILLINOIS, ASSIGNOR TO WESTERN ELECTRIC COMPANY, INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK

BLANK HANDLING APPARATUS

Application filed January 2, 1929. Serial No. 329,931.

This invention relates to blank handling apparatus, and more particularly to a blank holding and guiding apparatus for use with article forming apparatus.

The primary object of this invention is to provide a simple and efficient blank holding and guiding apparatus for use with article forming apparatus.

In accordance with the general features of this invention as applied to an article forming apparatus employing a pair of cooperating forming rolls, there is provided in one embodiment a substantially vertical magazine or holder for containing a supply of blanks. These blanks may vary in length and width, but the holder may be adjusted to accommodate a plurality of different types of blanks. A conduit attached to the holder supports and guides the blanks as they are successively advanced from the holder to the rolls by means carried by one of the rolls, and has a portion capable of adjustment with respect to the holder for accommodating blanks of varying thickness. Means is also provided for readily shifting the blank holder with the attached conduit as a unit longitudinally of the rolls or toward or away from the rolls.

Other objects and advantages of this invention will more clearly appear from the following detailed description, taken in connection with the accompanying drawing, in which

Fig. 1 is a fragmentary side view, partly in section, of an apparatus embodying the features of this invention shown applied to an article forming apparatus, partially illustrated;

Fig. 2 is a front view looking toward the right of Fig. 1, showing one side thereof, the opposite side being the same, only reversed;

Fig. 3 is a plan view of the complete apparatus on a reduced scale with only a portion of the framework of the article forming apparatus illustrated, and

Fig. 4 is a detail vertical section taken on the line 4—4 of Fig. 2.

Referring now to the drawing in detail wherein like reference numerals refer to similar parts in the several views, and particularly to Fig. 1 wherein the apparatus, for convenience, is illustrated in connection with an article forming apparatus which comprises a pair of spaced vertical side frame members 10 and 11, upon which is journaled a pair of cooperating article forming rolls 12 and 13. The roll 12 is composed of a plurality of individual annular sections and disposed therebetween are a plurality of disks 14, only one of which is illustrated in the drawing. Each of the disks 14 is provided with a plurality of equi-distantly spaced peripheral teeth or projections 15 extending beyond the peripheral surface of the roll 12. In the operation of the forming apparatus which has been briefly disclosed and described, since it forms no part in this invention and is not necessary to a complete understanding thereof, the forming rolls 12 and 13 are rotated in the direction indicated by the arrows (Fig. 1). The teeth or peripheral projections 15 of the rotating disks 14 successively engage individual blanks as they gravitate to the bottom of a magazine to be presently referred to and advance them between the peripheral surfaces of the forming rolls 12 and 13 by which they are formed into articles of the desired predetermined shape.

A vertical blank holding magazine and guiding apparatus embodying the features of this invention is indicated generally by the numeral 18. When applied to the article forming apparatus hereinbefore described, the holder is preferably mounted in a slightly inclined position, as illustrated in Fig. 1, above the roll 12 by means of a pair of brackets 19 secured to the vertical frame members 10 and 11 in a manner to be described hereinafter. The magazine 18 comprises a pair of spaced side elements 20, each element being composed of members 21 and 22 (Fig. 3) so shaped that upon their inner opposed faces they cooperate to provide vertical grooves or channels 25 for holding a column of blanks 27. Each of the members 22 is adjustably mounted upon its associated member 21 by means of a plurality of screws 28 passing through horizontal slots 29

formed in the member 22 and threaded into a rearwardly extending arm 32 of the member 21 (Figs. 1 and 3). It will be apparent that by means of the screws 28 and slots 29 the members 22 may be adjusted upon the members 21 to provide a predetermined, identical width to each of the channels 25 to accommodate blanks 27 of varying width.

Adjustably secured to the front face, as viewed in Fig. 2, of a vertical arm 33 of each of the brackets 19 is a block 34. These blocks are provided, as clearly shown in Fig. 3, upon their inner opposite faces with vertically extending notches 35 which receive the members 21 of the magazine 18, the members being clamped in position thereon by plates 36 removably secured to the blocks 34 by screws 39. Each of the blocks 34 is clamped to its associated arm 33 by means of a pair of screws 40 which project through relatively large diameter apertures 41 provided in the block 34 and threaded into the arm 33. It will be obvious, due to the large apertures 41, that the blocks 34 may be individually adjusted on the arm 33 in all directions, limited only by the difference in diameter between the apertures 41 and the shank of the screws 40. Thus the magazine side elements 20 may be adjusted toward or from each other to accommodate blanks 27 of varying length, which adjustment taken with the adjustability of the members 22 upon the members 21 hereinbefore described, provides a magazine for accommodating blanks of varying length and width, respectively. Also the magazine side elements 20 may be adjusted upwardly or downwardly upon the arms 33 for varying the relation of their lower extremities with the forming roll 12, the purpose of which will be made apparent hereinafter.

As clearly shown in Fig. 1 an arm 42 is fixed to the upper surface of each of the blocks 34 and extends over the upper surface of the associated arm 33 which is disposed below the lower surface of the arm 42. Fixed to the outer vertical side of each of the arms 33 is a similar arm 42 which is spaced from a similar side of the block 34. Threaded into each of the arms 42 is a thumb screw 43 for facilitating the adjustment of the blocks 34 upon the arm 33. It will be apparent that upon loosening the screws 40 of each block 34 and thereafter turning the vertical thumb screw 43 (Figs. 1 and 2) downwardly, the block will move in a similar direction or by turning the screw 43 upwardly the block may thereafter be raised by hand or by the use of a suitable tool. Similarly, the blocks 34 may be moved inwardly or outwardly upon the arms 33 and upon the desired adjustment thereof may be clamped in position by the screws 40.

At their lower extremities upon the front and rear faces, the magazine side elements 20 are interconnected by horizontal cross pieces 46 and 47. The cross piece 46 is provided with an arcuate portion 48 disposed in close proximity to the peripheral surface of the roll 12 and extending towards the roll 13. The upper surface of the portion 48, which is predeterminedly spaced from the lower spaced end surfaces of the members 21 and 22 of the spaced magazine elements 20, serves as a bottom for the magazine, the lowermost blank of the column of blanks 27 resting thereon as clearly shown in Fig. 1. The lower spaced end surfaces of the members 21 and 22 cooperating with the upper surface of the arcuate portion 48 of the cross piece 46 provides a discharge passage 49 in the magazine 18 (Fig. 1) for the blanks 27 as they are successively advanced therefrom by the peripheral teeth 15 of the rotating disks 14 in the operation of the forming apparatus, briefly described hereinbefore, the depth of the passage 49 being such that only one blank at a time may be advanced from the magazine 18. The cross piece 47 is also provided with an arcuate portion 50, an upper inner surface 51 of which is in line with the lower end surfaces of the elements 20 and cooperates with the upper surface of the arcuate portion 48 of the cross piece 46 to provide a confined guide channel or conduit 53 for the blanks 27 as they are advanced from the magazine 18 to a position wherein they are engaged between the forming rolls 12 and 13, the roll 12 with the disks 14 freely moving through the conduit 53.

Formed in each of the arcuate portions 48 and 50 of the cross pieces 46 and 47, respectively, is a plurality of spaced slots or openings 54, one of which is shown in Figs. 1 and 2, through which the peripheral teeth 15 of the disks 14 pass during the rotation thereof. The arcuate portion 50 of the cross piece 47 is provided with depending side portions 55 which are spaced apart just sufficiently to accommodate a blank positioned lengthwise therebetween (Figs. 2 and 3). An integral vertical portion 56 of the cross piece 47 is secured to the rear surfaces of the vertical magazine members 21 by screws 57. When adjusting the magazine 18 for another length of blank, as hereinbefore described, the cross piece 47 will be removed and another cross piece suitable for the particular length of blank will be mounted in place. The same screws 57 and the screw holes provided in the members 21 may be used to mount different cross pieces upon the members, the cross pieces being formed with suitably spaced screw apertures. For a different width of blank wherein the length remains the same it will be apparent that the cross pieces 46 and 47 need not be removed or adjusted to permit the adjustment of the members 22 upon the members 21 as hereinbefore described.

Referring to Figs. 1 and 3 it will be noted

that the rearwardly extending arm 32, as viewed in Fig. 3, and extending to the right as viewed in Fig. 1, of the magazine member 21 and the similar arm of the cooperating member 22 do not extend to the lower end of the arms disposed at right angles thereto, but only extend to a point slightly above the upper surface of the vertical portion 56 of the cross piece 47 so that the latter may span the spaced members 21 to which the cross piece is secured.

To provide a discharge passage 49 of predetermined depth in the magazine 18 for accommodating blanks of varying thickness, means is provided whereby the cross piece 46 may be adjusted either upwardly or downwardly upon the members 21 to predeterminedly space the upper surface of the arcuate portion 48 of the cross piece 46 from the lower end surfaces of the magazine members 21 to provide a passage 49 of a required depth. The cross piece 46 is provided with an integral vertical portion 60 which is clamped against the front surfaces of the vertical magazine members 21 by screws 61, one at each end of the cross piece (Fig. 3). The manner of adjusting the cross piece 46 upon the spaced magazine members 21 at each end of the cross piece is identical in each instance and therefore a description of the right end thereof, as viewed in Fig. 2, it is thought will be sufficient. The screw 61 extends through a vertical slot 62 (Figs. 2 and 4) formed in the portion 60 of the cross piece and is threaded into the magazine member 21. A vertically disposed key 63 is formed on the rear surface of the portion 60 surrounding the slot 62 and is adapted to freely slide in a keyway 64 formed in the front surface of the member 21 when the cross piece 46 is being adjusted. The keys and keyways 63 and 64 respectively, at each end of the magazine 18 serve to guide and limit the extent of adjustment of the cross piece 46 upon the member 21.

The cross piece 46 as illustrated in the drawing is adapted to be adjusted for five different predetermined positions upon the member 21. In other words, provision is made for five blanks 27 of varying thickness. To accomplish this feature, five apertures 67 are formed in vertical alignment in the portion 60 of the cross piece 46, as well as the member 21. Only one aperture 67 of the portion 60 and one aperture 67 of the member 21 can be axially aligned at a time and upon such alignment a predetermined depth of the passage 49 is provided for a particular thickness of blank. A headed pin 68 is entered in the aligned apertures 67 when the desired adjustment has been made and thereafter the cross piece 46 is clamped to the magazine member 21 by the screws 61. As shown in the drawing, the adjustment provides for a blank 27 of a certain thickness and the set of apertures 67 below the pin 68 provides for a blank which is a trifle less in thickness than that shown. To adjust the apparatus for this last mentioned thickness of blank, the pins 68 are withdrawn, the screws 61 are released, and thereafter the cross piece 46 is moved upwardly on the members 21 until the lower set of apertures 67 are aligned, the pin 68 is then inserted in the aperture and the cross piece reclamped to the members 21. If it is desired to adjust the apparatus for a blank of greater thickness than that illustrated, the pins 68 and the screws 61 are withdrawn and released, respectively, as before described and the cross piece 47 is moved downwardly until the lower set of apertures 67 of the three sets thereof just above the screws 61 are aligned, which will provide the desired depth of passage 49. The two sets of apertures 67 above the last mentioned set provide for successively greater depths for the passage 49, the upper set of apertures providing for the maximum thickness of blank 27 which can be discharged from the magazine 18 in the embodiment of the apparatus illustrated.

It will be necessary to remove the cross piece 47 when adjusting the magazine 18 for another length of blank in addition to the removal of the cross piece 46, as hereinbefore mentioned, and another cross piece 47 suitable for the particular length of blanks will be mounted in place, in which case the same screws 61 and the cooperating screw holes, the keyway 64 and the apertures 67 provided in the members 21 may be used to adjustably secure different cross pieces upon the members, the cross pieces being formed with a cooperating slot 62, key 63 and apertures 67.

When changing the position of the cross piece 46 upon the magazine members 21 in accordance with the thickness of the blank 27 being handled, it will be obvious that in order to maintain a predetermined relation between the arcuate portion 48 of the cross piece 46 and the peripheral surface of the roll 12, it will be necessary to correspondingly adjust upwardly or downwardly the magazine 18 with the cross pieces 46 and 47 carried thereon upon the arms 33 of the brackets 19 in the manner hereinbefore referred to.

It is believed that the novel adjustable features of the blank handling apparatus of this invention are clearly evident from the foregoing description and no further description is necessary.

Although the invention has been herein illustrated and described in connection with one embodiment thereof as applied to a particular article forming apparatus, it is to be understood that the novel features thereof are capable of various other applications within the scope of the appended claims.

What is claimed is:

1. In a blank handling apparatus for ar-

ticle forming means, means for holding a supply of blanks, including a member adjustable thereon to a plurality of vertical positions to provide a discharge passage of predetermined dimensions in the holding means for accommodating blanks of varying dimensions, and upon which the supply of blanks rests, and clamping means for maintaining said member stationary in any of its adjusted positions to provide a fixed dimension for the discharge passage.

2. In a blank handling apparatus for article forming means, article forming means, means for holding a supply of blanks, including a member adjustable thereon to a plurality of positions to provide a discharge passage of predetermined depth in the holding means for accommodating blanks of varying thickness and upon which the supply of blanks rests, the member having an extending portion for supporting the blanks between the discharge passage and the forming means.

3. In a blank handling apparatus for article forming means, means for holding a supply of blanks, including a member adjustable thereon to provide a discharge passage of predetermined depth in the holding means for accommodating blanks of varying thickness and upon which the supply of blanks rests, adjacent surfaces of the blank holding means and the member each provided with a plurality of predeterminedly spaced apertures, one aperture in each surface cooperating together when aligned to provide in the holding means a discharge passage of predetermined depth, and means including a member insertable in the aligned apertures for maintaining the adjustment.

4. In a blank handling apparatus for article forming means, article forming means, means for holding a supply of blanks, including a member adjustable thereon to a plurality of positions to provide a discharge passage of predetermined depth in the holding means for accommodating blanks of varying thickness and upon which the supply of blanks rests, the member having a portion extending towards the forming means, and means carried by the blank holding means and spaced from the extending portion of the member to provide a substantially closed guide channel for guiding the blanks between the discharge passage and the forming means.

5. In a blank handling apparatus for article forming means, a support, a holder mounted upon the support for containing a supply of blanks, the holder including spaced end elements, and means for adjusting and securing the elements in different horizontal and vertical positions upon the support for accommodating blanks of varying dimensions.

6. In a blank handling apparatus for article forming means, a support, a holder mounted upon the support for containing a supply of blanks, the holder including spaced end elements, each element comprising a pair of members adjustable relative to each other to provide for blanks of varying width.

7. In a blank handling apparatus for article forming means, a support, a holder mounted upon the support for containing a supply of blanks, the holder including spaced end elements, each element comprising a pair of members adjustable relative to each other to provide for blanks of varying width, and means for adjusting and securing the elements in different positions upon the support for accommodating blanks of varying length.

8. In a blank handling apparatus for article forming means, a support, a holder mounted upon the support for containing a supply of blanks, the holder including spaced end elements, each element comprising a pair of members adjustable relative to each other to provide for blanks of varying widths, and a member spanning the elements and attached to similar members of each element for providing a discharge passage for the blanks from the holder and upon which the supply of blanks rests.

9. In a blank handling apparatus for article forming means, a support, article forming means thereon, means carried by the support for holding a supply of blanks, including a conduit extending from a discharge passage of the holding means to the forming means and upon which the supply of blanks rests, means for adjusting a portion of the conduit upon the holding means for varying the depth of the discharge passage for accommodating blanks of varying thickness, and means for adjusting the blank holding means and the conduit as a unit in a plurality of directions upon the support to vary the relation of the conduit with the forming means.

10. In a blank handling apparatus for article forming means, means for holding a supply of blanks, including a member spaced from the lower end thereof upon which the supply of blanks rests, the space providing a discharge passage for the blanks from the holding means, the member having a portion extending towards the forming means, and means carried by the blank holding means and spaced from the extending portion of the member to provide a substantially closed guide channel for guiding the blanks between the discharge passage and the forming means, the spaced means having angularly oppositely disposed portions spaced from opposite ends of the extending portion of the member and providing end walls for the channel.

11. In a blank handling apparatus for article forming means, means for holding a supply of blanks, including a member adjust-

able vertically thereon to a plurality of positions to provide a discharge passage of predetermined depth in the lower end of the holding means for accommodating blanks of varying thickness and upon which the supply of blanks rests, a conduit for guiding the blanks from the passage to the forming means which includes an integral extending portion of the adjustable member serving as a floor for the conduit and a member carried by the holding means having a channel shaped portion spaced from and paralleling the extending portion of the adjustable member with opposite side wall members of the channel shaped portion extending downwardly outside the ends of the extending portion of the adjustable member.

12. In a blank handling apparatus, means for holding a stack of blanks, including a member upon which the stack of blanks rests, and which cooperates with the blank holding means to provide an opening for discharging the blanks laterally from the stack, means for adjusting the member with respect to the blank holding means to change a dimension of the discharge opening and means for rigidly maintaining the member stationary in any of its adjusted positions.

In witness whereof, I hereunto subscribe my name this 19 day of December A. D., 1928.

CHARLES EDWIN NELSON.