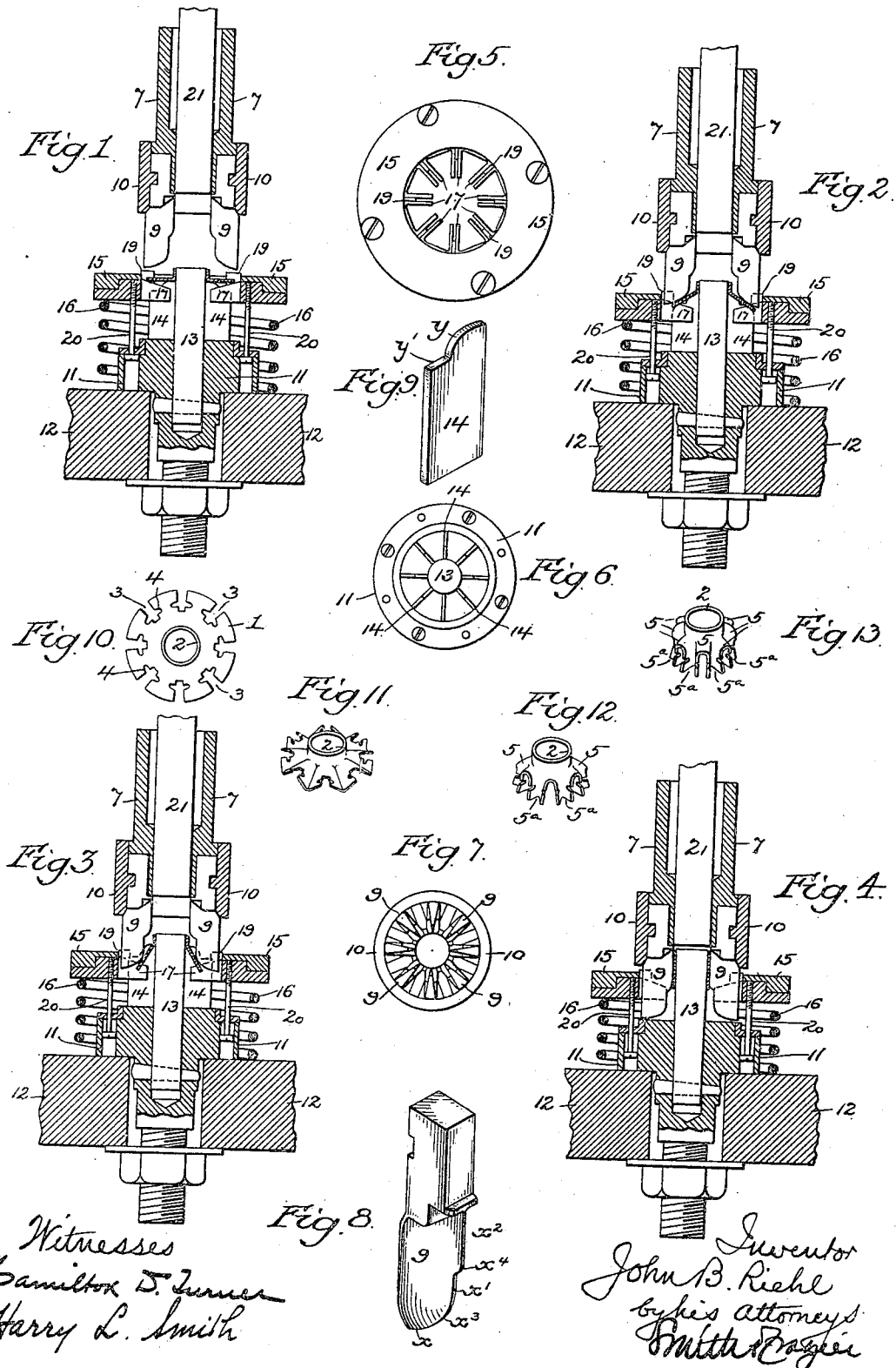


J. B. RIEHL.
 UMBRELLA NOTCH MAKING MACHINE.
 APPLICATION FILED SEPT. 10, 1908.

953,295.

Patented Mar. 29, 1910.



UNITED STATES PATENT OFFICE.

JOHN B. RIEHL, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO AMERICAN SPECIALTY MANUFACTURING COMPANY, OF DOVER AND PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF DELAWARE.

UMBRELLA-NOTCH-MAKING MACHINE.

953,295.

Specification of Letters Patent. Patented Mar. 29, 1910.

Application filed September 10, 1908. Serial No. 452,352.

To all whom it may concern:

Be it known that I, JOHN B. RIEHL, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Umbrella-Notch-Making Machines, of which the following is a specification.

The object of my invention is to provide means for pressing, from a sheet metal blank, an umbrella notch or runner head, an object which I attain in the manner hereinafter set forth, reference being had to the accompanying drawing, in which—

Figures 1, 2, 3 and 4 are views illustrating, in different positions, the dies whereby the notch or runner head is produced; Figs. 5 and 6 are top or plan views, and Fig. 7 is a bottom or inverted plan view, of the dies employed; Fig. 8 is an enlarged perspective view of a member of one of the dies; Fig. 9 is a similar view of a member of another one of the dies, and Figs. 10, 11, 12 and 13 are views illustrating the successive stages in the production of the notch or runner head.

Before describing the dies whereby the notch or runner head is formed, it may be well to state briefly, in connection with Figs. 10 and 13, the manner in which the same is produced.

The blank shown in Fig. 10 consists of a flat disk 1 with an upturned central tubular neck 2, the disk having in its outer portion a series of radial slots 3 with opposite recesses 4 near their inner ends. In transforming this blank into the notch or runner head, those portions of the blank in line radially with the slots are properly supported while the intervening portions of the blank are subjected to downward pressure which gradually forces them from a horizontal to a vertical position and wraps the slotted portions of the blank around their supports, the successive stages of production being represented in Figs. 11, 12 and 13, the latter figure representing the finished notch or runner head which has hollow ribs 5 with slotted outer ends and notched sides, these ribs being separated from one another by open grooves 5^a.

In performing the operations necessary to convert the blank shown in Fig. 10 into the notch or runner head shown in Fig. 13 three dies are employed, which may, for conven-

ience, be referred to as the upper die, the lower die and the outer die.

The upper die consists of a tubular plunger 7 with depending fingers 9, which, in the present instance, are let into recesses in the lower end of the plunger and are confined therein by a ring 10, although, if desired, the fingers may constitute an integral part of the plunger. Guided within the tubular plunger is an ejector rod 21. Each of the fingers 9 is transversely rounded on its inner face and presents a bottom face α slightly inclined in respect to the horizontal, vertical or substantially vertical inner faces α' and α'' , in different vertical planes, a curved or rounded connection α^3 between the bottom face and the lower vertical face, and a rounded connection α^4 between the upper and lower vertical faces, (see Fig. 8).

The lower die consists of a block 11 secured in any suitable manner to the bed plate 12 of the machine and having a central, upwardly projecting post 13 with radially projecting bits 14, which may either be integral with the central post or may be separate therefrom and suitably secured thereto, each of these bits 14 presenting a curved upper face as shown at y , in Fig. 9 and a horizontal shoulder y' at the bottom of said curved face.

The outer die consists of a ring 15 surrounding the lower die and supported upon a coiled spring 16 interposed between said ring and the bed plate 12, and said ring has inwardly projecting slotted bits 17 which embrace the bits 14 of the lower die, each of said slotted bits 17 having, at the outer end of the slot, an upwardly projecting lug 19.

The bits 17 may either be integral with the ring 15 or may be made separately therefrom and suitably secured thereto, and the ring 15 is also provided with downwardly projecting bolts 20 having enlarged heads playing in openings in the base block 11 of the lower die in order to guide the ring 15 in its vertical movement and restrict the rise of the ring under the lifting influence of the coiled spring 16.

In the operation of the device the tubular neck of the blank is first slipped over the projecting upper end of the post 13, the blank being properly disposed in respect to the fingers 9 of the upper die and the bits 14 of the lower die by reason of the engage-

ment of the lugs 19 of the outer die with the ends of the radial slots formed in the blank. The blank being thus positioned, the upper die is caused to descend so that the fingers 9 of the same will act upon and gradually depress the metal of the blank between the portions which are in line radially with the slots, the latter being supported upon the bits 14 of the lower die, and, as the upper die descends, the metal upon which the fingers 9 act will be gradually forced into conformation with the shape of said bits 14, the bases of the slots 3 contacting with the shoulders y' and the intervening portions of the blank being acted upon first by the bottom faces x of the fingers, 9, then by the curved connections x^3 , then by the lower vertical faces x' , then by the curved connections x^4 , and finally by the upper vertical faces x^2 , and being thereby gradually pressed downward and inward between the bits until the blank is finally reduced to the condition of the completed notch with the hollow ribs enveloping said bits 14 and the fingers 9 of the upper die occupying the recesses between said hollow ribs, as shown in Fig. 4. As the formation of the notch proceeds the outer die is gradually forced downward by the pressure of the peripheral portions of the blank upon the slotted bits 17, the spring 16 being thereby compressed, as shown in Fig. 4. When, after having completed its work, the upper die is raised, it carries the completed notch with it and the recoil of the spring 16 forces the outer die upwardly to its normal position. As the upper die rises, the rise of the ejector rod 21 is restrained by any suitable means, and said rod thereby serves to strip the completed notch from the die. Owing to the shape of the acting faces of the fingers 9 of the upper die and to the rounded upper faces of the bits 14 of the lower die, the metal of the blank is displaced without any violent strain upon the same and without any tendency to disrupt it.

It will, of course, be understood that the terms "upper" and "lower" are relative terms, used simply for convenience, since the disposition of the various dies may be such that what is termed the upper die may move either downwardly, horizontally, diagonally or upwardly, in acting upon the metal of the blank.

I claim:—

1. In a machine of the character described, the combination of a lower die having a series of radially projecting bits, and a central post projecting above the same, with an upper die having a central opening to receive said post, and depending fingers adapted to enter the spaces between the bits of the lower die.

2. In a machine of the character described, the combination of a lower die having ra-

dially projecting bits, with an upper die having depending fingers serving to press the material acted upon into the spaces between said bits, each of said fingers having two substantially vertical inner faces in different vertical planes, the lower faces being farthest from the axis of the die and both vertical faces acting upon the material which is being pressed by the die.

3. In a machine of the character described, the combination of a lower die having radially projecting bits, with an upper die having depending fingers adapted to enter the spaces between said bits, each of said fingers having two substantially vertical inner faces in different vertical planes, and a curved connection between said faces, the lower vertical faces being farthest from the axis of the die, and both of the vertical faces and the curved connection between them acting upon the metal which is being pressed by the die.

4. In a machine of the character described, the combination of a lower die having radially projecting bits, with an upper die having depending fingers adapted to enter the spaces between said bits, each of said fingers having two substantially vertical inner faces in different vertical planes, a curved connection between the bottom face and the lower vertical face, and a curved connection between the two vertical faces, the lower vertical faces being farthest from the axis of the die and the bottom face, the two vertical faces, and the two curved connections of each finger acting upon the material which is being pressed by the die.

5. In a machine of the character described, the combination of a lower die having radially projecting bits, an outer die cooperating with said lower die to support a flat blank, and an upper die having depending fingers adapted to enter the spaces between the bits of the lower die and to press the corresponding portions of the flat blank into a plane at a right angle to that which they occupy in the blank.

6. In a machine of the character described, the combination of a lower die having radially projecting bits, an outer die cooperating with the lower die to provide support for a flat blank, said outer die having upwardly projecting bits for entering notches in the blank and positioning the latter, and an upper die having depending fingers adapted to enter the spaces between the bits of the lower die and to press corresponding portions of the blank into a plane at a right angle to that which they occupy in the blank.

7. In a machine of the character described, the combination of a lower die having radially projecting bits, an upper die having depending fingers adapted to enter the spaces between said bits, and an outer die

having inwardly projecting slotted bits for engaging the projecting bits of the lower die.

5 8. In a machine of the character described, the combination of a lower die having radially projecting bits, an upper die having depending fingers adapted to enter the spaces between said bits, and an outer die having inwardly projecting slotted bits for engaging the projecting bits of the lower die, said slotted bits having upwardly projecting lugs at their outer ends.

10 9. In a machine of the character described, the combination of a lower die having radially projecting bits, an upper die having depending fingers adapted to enter the spaces between said bits, and an outer die

mounted upon an elastic support and having inwardly projecting bits which engage those of the lower die.

20 10. In a machine of the character described, the combination of a lower die having a series of radially projecting bits, each with curved upper end terminating in a horizontal shoulder, with an upper die having depending fingers adapted to enter the spaces between the bits of the lower die.

25 In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

JOHN B. RIEHL.

Witnesses:

HAMILTON D. TURNER,
ELSIE FULLERTON.