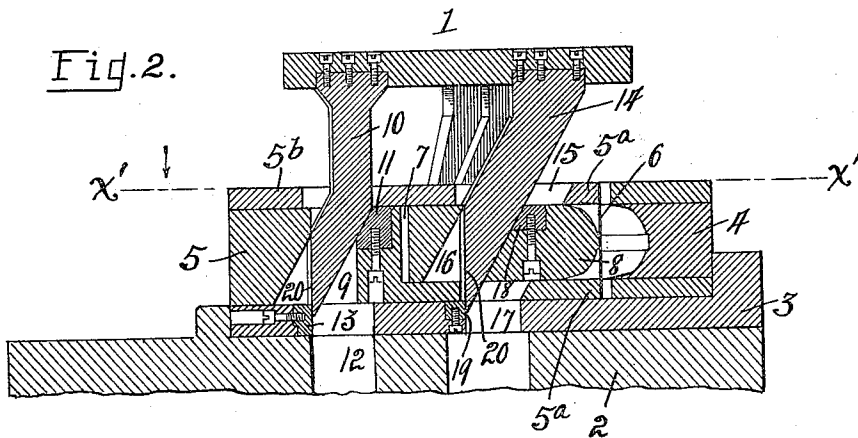
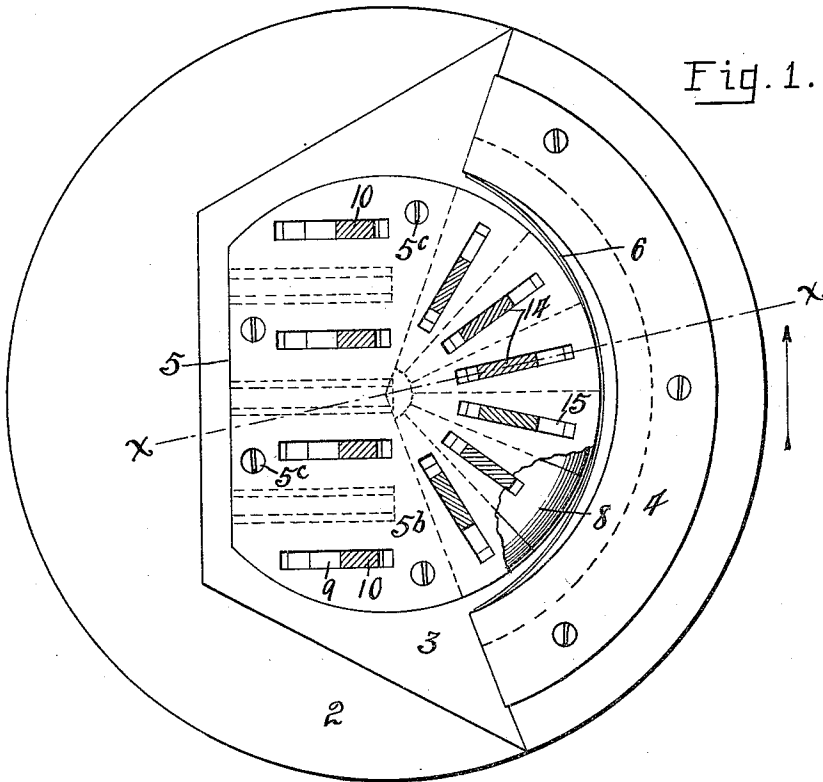


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SHEET METAL SHAPING MEANS.
APPLICATION FILED APR. 24, 1913.

1,129,625.

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WITNESSES:
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UNITED STATES PATENT OFFICE.

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SHEET-METAL-SHAPING MEANS.

1,129,625.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, LEONHARD BAUROTH, a citizen of the United States, and a resident of Toledo, in the county of Lucas and State of Ohio, have invented a certain new and useful Sheet-Metal-Shaping Means; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings and to the characters of reference marked thereon, which form a part of this specification.

This invention relates to drawing or shaping machines for sheet-metal or other sheet goods capable of retaining a shape into which they may be formed.

The object of my invention is the provision of simple, efficient and improved mechanism of this character wherein a movable plunger part produces a differential reciprocation of a blank-holder and movable shaping die or means, whereby the blank-holder precedes the shaping means in its engagement of a work-blank and then pauses or dwells during the work drawing movement of said means, thus holding the work and preventing a wrinkling thereof during the drawing operation.

A further object of my invention is the provision of a mechanism of this character the blank-holder and shaping means of which act in a plane which intersects the plane of the force moving said blank-holder and means.

The invention is fully described in the following specification, and while, in its broader aspect, it is capable of embodiment in numerous forms, a preferred embodiment thereof is illustrated in the accompanying drawings, in which,—

Figure 1 is a sectional plan view of a mechanism embodying the invention taken on the line x' , x' in Fig. 2, with a part broken away, and Fig. 2 is a vertical section of the mechanism taken on the line x , x in Fig. 1.

Referring to the drawings, 1 designates a reciprocally movable head, which may be attached to or constitute a part of an operating plunger or other moving agent. Mounted on a bed or suitable support 2 below or in

the path of movement of the head 1 is a bed-plate 3 to which is fixed a stationary die 4, which is the matrix die, in the present instance, and has its cavity or shaping surface opening transversely of the plane of movement of the head 1 and elongated in segmental form to adapt it for the shaping of mud-guards for bicycles, motorcycles or the like, segments of wheel rims, or for any other purpose for which it may be adapted or appropriate. It is to be understood that the die 4 is not limited to any particular shape, or to the forming of any particular article.

Mounted on the bed-plate 3 for sliding movements toward and away from the working face of the die 4 in an intersecting plane to the plane of movements of the head 1 is a blank-holder 5, having the blank-holding edges 5^a in register with the respective marginal edges of the die 4 to coöperate therewith to grip interposed edge portions of a work-blank 6. The edge or portion of the blank-holder 5 which is adjacent to the working face of the die 4 is recessed intermediate the work-gripping edges 5^a of the blank-holder, as indicated at 7, and mounted, in the present instance, in the recess or socket 7 for reciprocatory movements toward and away from the die 4 relative to the blank-holder are a plurality of sections or blocks 8, which coöperate to form a drawing or shaping die, the outer or working face of which is complementary to the forming surface of the die 4. The working face of the die 4 and the surface of the blank-holder 5 and movable die are, in the present instance, of circular or segmental form and the die blocks or sections 8 are therefore of sector form and adapted to have radial work-shaping and retracting movements. The blocks 8 laterally abut against each other when in retracted position and are necessarily slightly spaced when at the limits of their outstrokes. It will, of course, be understood that the movable die can be made of a single piece or in any number of sections, as desired, but it is found preferable in practice to form the same of a plurality of comparatively small sections substantially as shown, as a more even and efficient drawing of a work-blank is thereby accomplished. The blank-holder 5, in the present instance, is

shown as having a removable top plate or portion 5^b which is secured to the body portion thereof by screws 5^c, or in any other suitable manner, and closes the top of the socket 7.

Projecting downward from the head 1 and working in registering sockets 9 in the blank-holder 5, at the rear of the socket 7 therein, are a plurality of arms 10, which have their lower end portions inclined in relation to the direction of movement thereof and in thrust contact with complementary surfaces of the sockets 9, whereby reciprocatory movements of such arms will have a wedge-like action on the blank-holder to impart reciprocatory movements thereto in a plane which intersects the plane of movement of the arms, as is clearly apparent by reference to Fig. 2. A hardened thrust-block 11 forms a part of the forward wall of each socket 9 to receive the work gripping thrust of the respective arms. Each socket 9 is in register with a socket 12 in the bed 2 and bed-plate 3 for the lower end of the respective arm 10 to work into, and the upper portion of the rear side of the wall of the socket 12 is provided with a thrust-block 13, which, in the present instance, is attached to the bed-plate 3, for receiving the bearing thrust of the lower end portion of the associated arm 10 in opposition to the thrust-block 11, thus bracing the lower ends of the respective arms 10 against rearward movements during a blank clamping action of the blank-holder. It will be noted that the lower or outer end portions only of the arms 10 are inclined relative to the plane of movements thereof whereby such arms will be caused to move the blank-holder to blank-clamping position during the initial portion of a down-stroke of the head 1 and will permit the blank-holder to stand at rest in blank-gripping position during the remaining portion of the down-stroke of the head and during the first portion of the up-stroke thereof.

A set of arms 14, which are similar to the arms 10, project downward from the head 1 in advance of the arms 10 and through registering slots or openings 15 in the upper wall of the blank-holder socket 7 and openings 16 in the die blocks 8, with their lower ends working through the bottom wall of the blank-holder socket 7 and into registering openings 17 in the subjacent parts. The arms 14 are inclined rearwardly for the greater portion of their lengths, and the opening 16 of the die blocks 8 are inclined in complementary relation, whereby the die blocks are forced outward into the matrix die 4 by wedge action of the arms 14 thereon upon a down-stroke of the head 1, and are retracted within the blank-holder 5 upon an up-stroke of said head. A hardened thrust-block 18 is preferably carried by each

die block 8 to receive the outward thrust of the associated arm 14 thereon, and a similar block 19 is disposed in the rear wall of the bed-plate opening 17 to receive the opposing thrust of the arm thereon. It will be noted that the arms 10 and 14 have the side surfaces 20 thereof which coact with the stationary thrust blocks 13 and 19, respectively, straight in the planes of movement of such arms and of a length equal to the stroke of the arms.

It is evident that during a down and up-stroke of the head 1, or cycle of movement thereof, both the blank-holder and die blocks 8 move in planes intersecting the plane of movement of said head, and that the blank-holder 5 moves to clamp the marginal edge portion of a work-blank 6 to the stationary die 4 and then dwells or stands at rest during the blank shaping movement of the die 8 and during a portion of its retracting movement, after which the blank-holder is moved to release the work.

This invention is claimed broadly in a co-pending application filed by me on July 16, 1914, Serial No. 851,357, and the claims herein are limited to the construction illustrated or the equivalent thereof.

It will be understood that the invention is not limited to the shaping of work in any particular form or to any particular arrangement, form or construction of the parts, except in so far as such limitations are specified in the claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is,—

1. In combination, a blank-holder, a plurality of circularly arranged die sections, and means for imparting radial movements to said die sections and for moving the blank-holder and causing it to stand or dwell during a portion of the movements of the die sections.

2. In combination, a reciprocally movable blank-holder, a set of circularly arranged die sections mounted in said holder, and means operable to radially move said die sections and to move the blank-holder during a portion only of the movements of the die sections.

3. In combination, a blank-holder, a set of circularly arranged radially movable die sections, and movable operating means having a wedge-like action on the die-holder to move it to and from blank holding position and to cause an intermediate dwell thereof and for operating on the die sections to impart radial movements thereto.

4. In combination, a blank-holder, a set of circularly arranged radially movable die sections, and operating means having a wedge-like action on the die sections to impart radial reciprocatory movements thereto and acting on the blank-holder to impart

reciprocatory movements thereto and to cause it to dwell during a portion of the movement of the die sections.

5 5. In combination, a blank-holder, a set of circularly arranged die sections, and means operable to have wedge-like action on the blank-holder and on said die sections to impart reciprocatory movements to each and to cause the blank-holder to dwell during a portion of the movements of the die sections.

10 6. In combination, a blank-holder, a set of circularly arranged dies mounted within a part of the blank-holder and movable relative thereto, and means operable in a plane at variance to the planes of movement of the blank-holder and die sections for imparting reciprocatory movements thereto and causing the blank-holder to dwell during a portion of the movements of the die sections.

20 7. In combination, a blank-holder having a circular working face provided with a socket, a set of circularly arranged dies

mounted in said socket for radial movements, and means operable to impart reciprocatory movements to said blank-holder and dies and causing the blank-holder to stand at rest during a portion of the die movements.

8. In combination, a blank-holder a set of dies mounted in said blank-holder for radial movements relative thereto, a part reciprocally movable relative to said blank-holder and dies and having members for coacting with said blank-holder and dies to impart reciprocatory movements thereto in planes at variance to the plane of movement of said part and causing the blank-holder to dwell during a portion of the die movements.

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

LEONHARD BAUROTH.

Witnesses:

S. T. KLOTZ,

E. E. THOMAS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."