C. SONNEBORN.

EXPANDING HEAD.

APPLICATION FILED APR. 1, 1914.

1,120,100. Patented Dec. 8, 1914.

FIG. 4

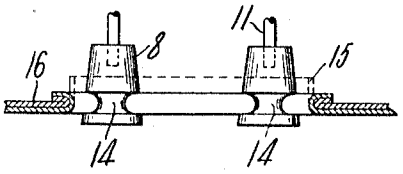


FIG. 1

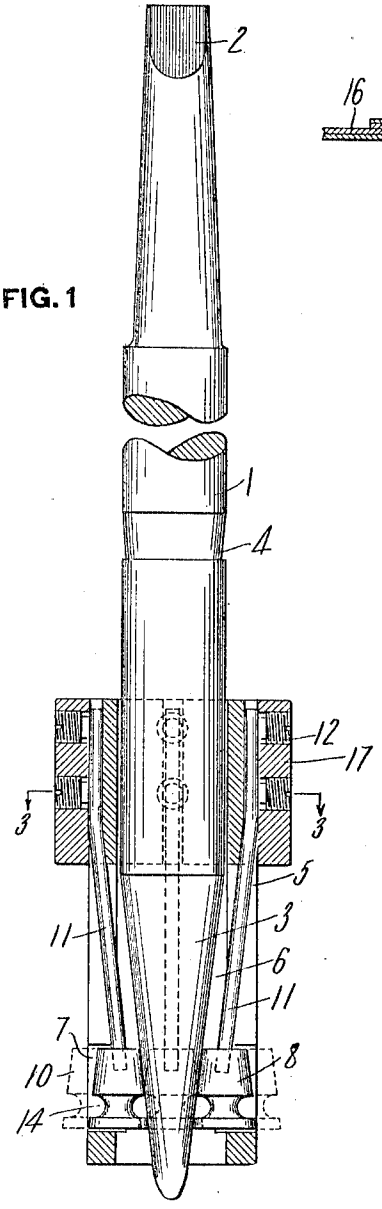


FIG. 3

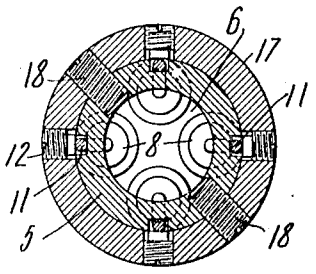
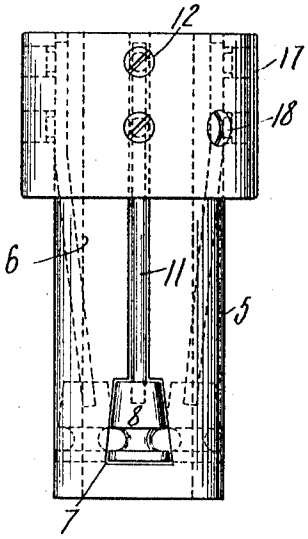


FIG. 2



WITNESSES

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UNITED STATES PATENT OFFICE.

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EXPANDING-HEAD.

1,120,100. Specification of Letters Patent. Patented Dec. 8, 1914.

Application filed April 1, 1914. Serial No. 828,862.

To all whom it may concern:

Be it known that I, CHARLES SONNEBORN, a resident of West Pittsburg, in the county of Lawrence and State of Pennsylvania, have invented a new and useful Improvement in Expanding-Heads, of which the following is a specification.

This invention relates to an expanding device, and more particularly a device for expanding a ring or thimble and forming the same into a bead, such for instance as is formed in joining together two sections or columns of sheet metal radiators.

The object of the invention is to provide a device for this purpose which effectively expands and beads the ring or thimble, which is simple in construction, easy of manipulation, and durable and lasting in operation.

The invention comprises the construction and arrangement of parts hereinafter described and claimed.

In the accompanying drawing, Figure 1 is a side elevation of the rollers and expanding and driving spindle and a vertical longitudinal section through the expanding head, and in dotted lines indicating the rollers expanded; Fig. 2 is an outside view of the expanding head; Fig. 3 is a cross section of the same on the line 3—3, Fig. 1; and Fig. 4 is a detail view illustrating the action of the expanding rollers.

The expanding device comprises a rotatable spindle 1, which may be driven in any suitable way and by any suitable means, the drawing merely illustrating the same provided with the usual tang 2 for connection to an ordinary press spindle. The lower portion 3 of the spindle 1 is tapered to expand the rollers, as hereinafter appears, and some distance above the tapering portion the spindle is provided with a shoulder 4 for a purpose which will hereinafter appear.

Loosely surrounding the spindle is the expanding head 5 which is provided with an axial bore or opening 6 for receiving the spindle 1. This expanding head near its lower end is provided with an opening or openings 7 extending entirely through its walls for receiving the expanding roller or rollers 8. One or more rollers can be employed, but preferably there will be three or more, the drawings showing four spaced uniformly about the axis of the expanding head. These rollers are of such size that they project both within the opening 6 of the head and also beyond the outer surface of said head, and are arranged with their axes longitudinal of the head (substantially parallel to the axis of the head), and are freely radially movable in the openings 7. They are normally held in their inward or retracted position with their outer peripheries projecting only slightly beyond the periphery of the head, and are adapted to be contacted by the tapering portion 3 of the spindle 1 and gradually pushed outwardly, as indicated in dotted lines at 10 in Fig. 1. Suitable spring means are provided for holding the rollers in the retracted position, the means illustrated being a straight spring 11 having its end loosely entering a small axial opening in the end of the roller and having its other end suitably secured to the head 5, such as by means of clamping screws 12. The body is grooved or slotted upwardly from the openings 7, said grooves extending entirely through the wall of the body for some distance upwardly, but above the same are cut only partly through the wall of the head in order to form a seat for the ends of the springs 11. These spring arms are of such shape that they normally hold the rollers in their inward positions, so that the pushing of the rollers radially outwardly by the tapered spindle puts the springs under tension. The rollers are of such length that their upper and lower ends are nearly in contact with the end walls of the opening 7 and are therefore held by the springs 11 against accidental escape.

The contour of the expanding rolls may be of any shape, depending upon the article to be expanded. For expanding the collars joining sheet metal radiator sections, said rollers are preferably slightly conical, as shown, and each is provided with a peripheral groove 14. Fig. 4 shows the rollers adapted to expand the collar 15 over the member 16 and form a beaded joint. The peripheral grooves 14 are of such size and shape as to properly expand and bead this joint. Various changes may, however, be made in the shape of the rollers and of the grooves therein, to suit different classes of work.

The upper end of the head 5 is enlarged, as at 17, and is preferably knurled, so that it can be firmly held when grasped by the

hand. This upper enlarged portion may be an integral portion of the body or a separate member, but for convenience of manufacture is preferably a separate sleeve suitably secured thereto, such as by screws 18. This expanding head is carried loosely on the rotating spindle 1, and is itself rotated slowly by frictional contact of the rollers 8 with the spindle 1. In use the head is entered in the article to be expanded and the rotating spindle then lowered down into said head, its tapering portion 3 contacting with the rollers 8 and forcing the latter radially outwardly. This frictional contact is sufficient to set the rollers 8 and the expanding head into rotation, the rollers rotating upon their own axes and also revolving with the head. The spindle 1 is forced downwardly gradually until the expanding operation is completed, and is then lifted, whereupon the head ceases to rotate and the springs 11 draw the rollers inwardly, out of engagement with the expanded article, whereupon the operator grasps the knurled portion 17, and lifts the head out of the article being expanded and slides it upwardly on the spindle 1 until the rollers engage above the shoulder 4, in which position the head will remain until a new article is brought into place for expanding, whereupon the operator again grasps the head and by a quick movement downwardly disengages the rollers from the shoulder 4 and lowers the head down into the new article to be expanded, whereupon the foregoing operations are repeated.

The device described is of simple construction and very durable and lasting in use. It is easy to manipulate, and effectively expands the joints described.

What I claim is:—

1. An expanding device, comprising a head provided with an axial opening and having openings through its wall and longitudinal slots extending from said openings, rollers mounted in said openings for radial movement with their axes longitudinal of the head, spring arms secured in said head and lying in the longitudinal slots thereof and having their ends engaging the rollers, a collar rigidly secured to said head, set screws threaded through said collar and engaging said springs, and a tapered rotary spindle adapted to enter said head, contact said rollers, expand and rotate the same and revolve said head.

2. An expanding device, comprising a head provided with an axial opening and having openings through its wall and longitudinal slots extending from said openings, rollers mounted in said openings for radial movement with their axes longitudinal of the head, spring arms secured in said head and lying in longitudinal slots thereof and having their ends engaging said rollers, a collar surrounding the slotted portion of said head, means for rigidly securing said collar to said head, means carried by said collar for clamping said spring arms in said slots, and a tapered rotary spindle adapted to enter said head, contact said rollers, expand and rotate the same and revolve said head.

3. An expanding device, comprising a head provided with an axial opening, a roller mounted in said head for axial movement with its axis longitudinal of the head, and a spindle having a tapered portion adapted to enter said head, contact said roller and expand the same, the end of said spindle adjacent the larger end of said tapered portion being provided with a shoulder arranged when the head is elevated to be engaged by said roller and hold the head in elevated position.

4. An expanding device, comprising a head provided with an axial opening, a roller mounted in said head for axial movement with its axis longitudinal of the head, and a cylindrical spindle having one end tapered and adapted to enter said head, contact said roller and expand the same, the cylindrical portion of said spindle being provided with a shoulder arranged when the head is elevated to be engaged by said roller and hold the head in elevated position.

In testimony whereof, I have hereunto set my hand.

CHARLES SONNEBORN.

Witnesses:
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ELBERT L. HYDE.

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