

Aug. 15, 1933.

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1,922,087

HEAD FOR FORMING ROLLED AND EXTRUDED METAL ARTICLES

Filed July 10, 1931

2 Sheets-Sheet 1

Fig. 1.

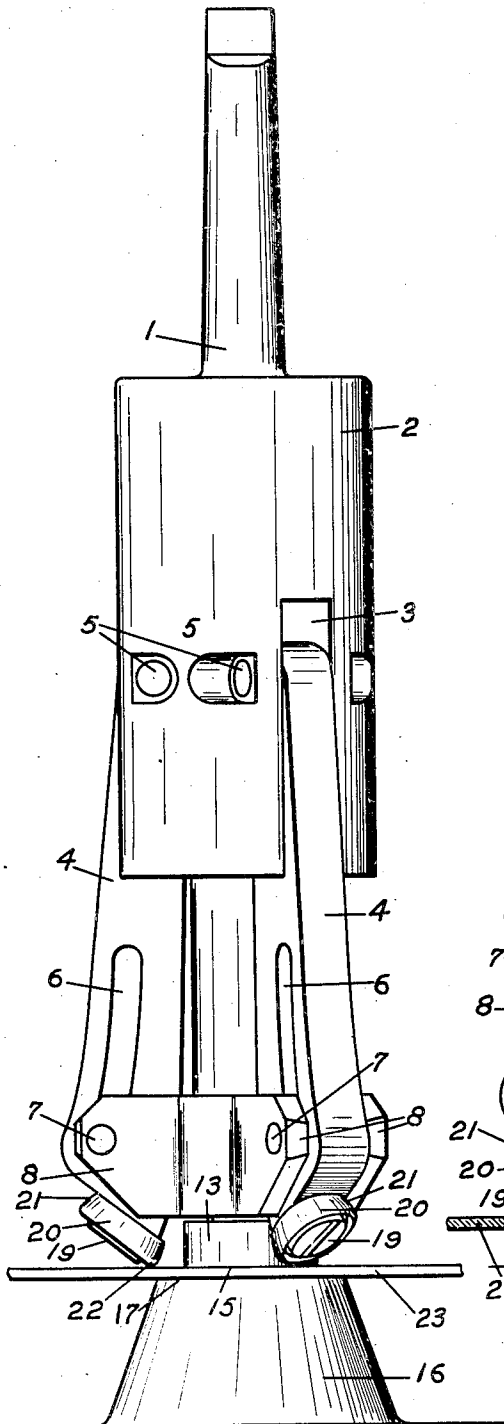
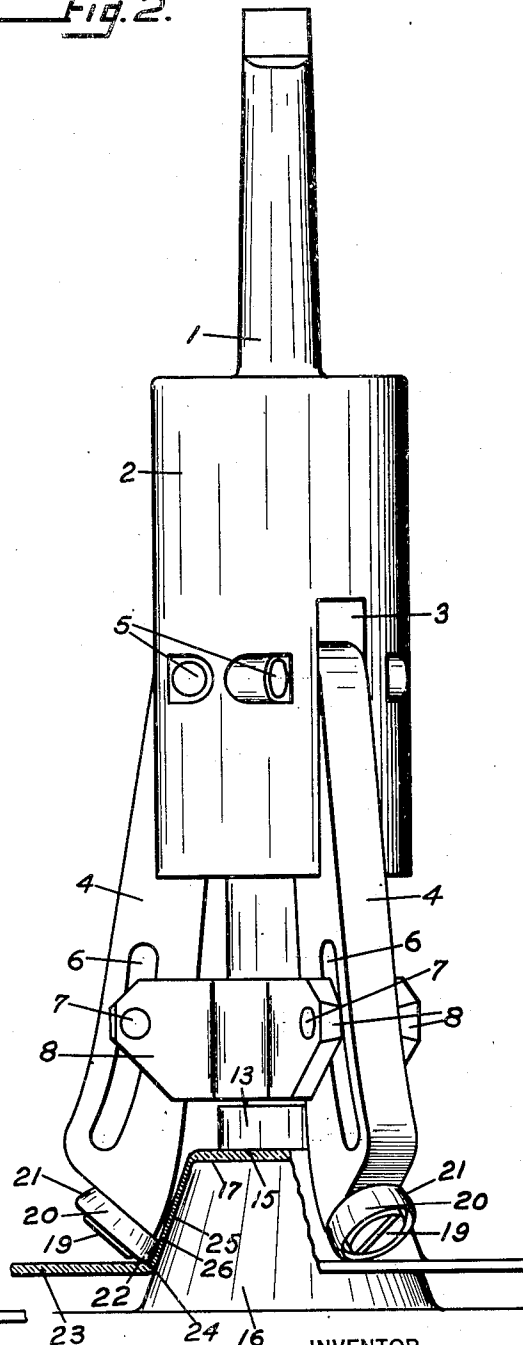


Fig. 2.



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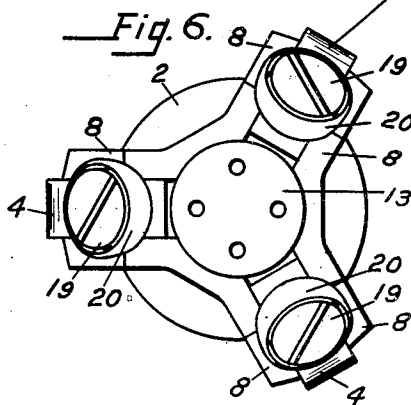
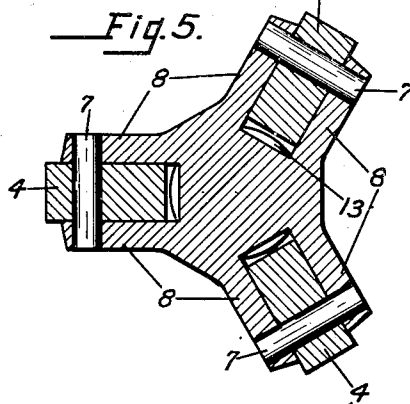
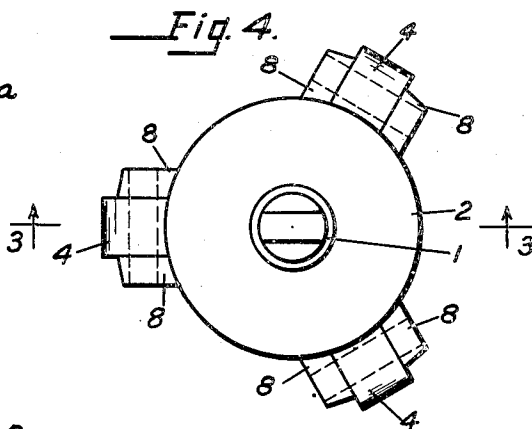
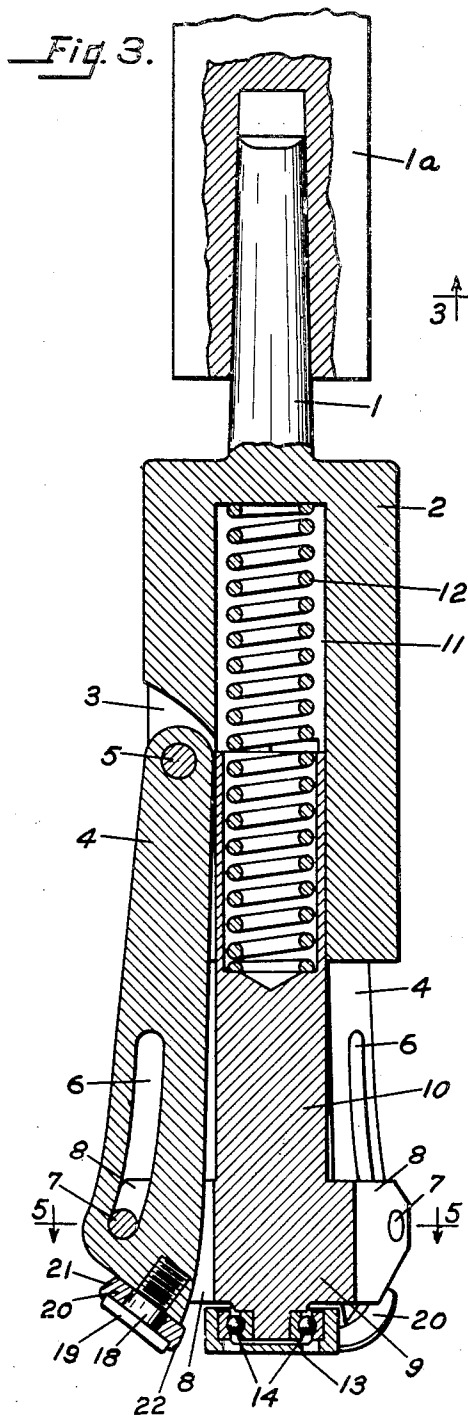
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1,922,087

HEAD FOR FORMING ROLLED AND
EXTRUDED METAL ARTICLES

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Application July 10, 1931. Serial No. 549,856

11 Claims. (Cl. 113—52)

My invention relates to a head for forming rolled and extruded metal articles.

It is the object of my invention to provide a head adapted to rotate, to support a plurality of rotatable, pivotally mounted arms and to guide those arms downwardly and outwardly in a predetermined path and to support on the end of the arms as they rotate and move downwardly and outwardly forming tools adapted to roll and extrude simultaneously a sheet of metal without changing the thickness or configuration of that portion of the metal which is untouched by the tools.

In particular, it is my object to provide mechanical means for guiding the rollers downwardly as they rotate in a path that is substantially a straight line to conform to the straight line surface of a form over which the metal is being extruded.

In particular, it is my object to provide in such a combination a forming tool that has a rolling surface and an extruding edge so that the thickness of the metal, where engaged by the roller, will be reduced, the metal will be rolled to form and its surface maintained in smooth and even condition.

It is an additional object to provide retaining means for holding the metal in position on its form while being extruded and rolled and for yieldingly accommodating the relationship between the support for the roller arms and the retaining means.

Referring to the drawings:

Figure 1 is a side elevation of the forming head with a sheet of metal in position to be formed resting on top of the form;

Figure 2 is a similar view showing the former part way through its work with the metal sheet broken away to show the nature and extension of the rolling and extrusion that has taken place;

Figure 3 is a section on the line 3—3 of Figure 4;

Figure 4 is a top plan view;

Figure 5 is a section on the line 5—5 of Figure 3;

Figure 6 is a bottom plan view.

Referring to the drawings in detail, 1 is a stem for attaching the head to a drill press or similar mechanism, generally designated, for rotating the head as at 1a, which mechanism can reciprocate it and rotate it. 2 indicates an arm supporting sleeve upon which is pivotally mounted in the slots 3 the cam arms 4 on the

pivots 5. These cam arms are provided with arcuate cam slots 6 in which are mounted the stationary pins 7 so that, as the arm supporting sleeve 2 descends, the arms will be guided downwardly and outwardly in the paths determined by the slots 6 and cam pins 7.

These pins are supported between the ears 8 carried on the head 9.

This holding head 9 is provided with a sleeve 10 which reciprocates within the cylinder 11 of the arm supporting sleeve 2. Between these two members within the cylinder 11 is a helical spring 12.

The thrust on the bottom of the retaining head 13 is taken by the ball bearings 14. This retaining head rests upon the top of the metal at 15 to hold it upon the conical form or support 16 against the top 17 thereof.

The arms 4 have stud shafts 18 with heads 19 for supporting rotatably the rollers 20 which have arcuate rolling faces 21 and extrusion shoulders 22. The shoulder 22 engages with the flat surface of the metal sheet 23 as at 24 to extrude it downwardly over the face 25 of the conical form 16. The roller face 21 cooperates in completing this extrusion process and rolls the metal 26 thus extruded to the desired form and evens the surface of the metal with the result that the metal at 15 and 23 is undisturbed physically while the metal at 26 is changed in its configuration and in its thickness.

It will be understood that I select the cam slot 6 of such curvature that the roller surface will generally travel downwardly in a straight line substantially parallel to the surface 25 of the conical form 16. It is obvious that I might employ the reverse construction by placing the guide mechanism at the top of the arm and the pivot at 7.

It is further obvious that, instead of reciprocating the arms and rollers, I can reciprocate the form 16.

It is obvious that, instead of rotating the arms and rollers and reciprocating them, it is possible to rotate and reciprocate the form, but, in practice, I find it more convenient to reciprocate and rotate simultaneously and to guide the arms and rollers while the rollers are rotating about their own axis retaining the form 16 stationary.

It will be understood that I desire to comprehend within my invention such modifications as may be necessary to adapt it to varying conditions and uses.

Having thus fully described my invention, what

I claim as new and desire to secure by Letters Patent, is:

1. In combination, an arm supporting member, a plurality of arms pivoted thereto, means to guide said arms downwardly and outwardly, said means including a stem having a rotatable head thereon, and means on the ends of said arm for extruding metal engaged by the head and for rolling the metal so extruded, said guiding means being arranged to guide said roller and extruding means substantially in a straight line downwardly and outwardly.

2. In combination, an arm supporting means adapted to be rotated, a plurality of arms on said means and having cam slots to guide them, a guide for said means having means engaging said cam slots, means for permitting of relative movement between said cam slot engaging means and said arms while guiding said arms, said means on the ends of said arms for extruding a metal sheet.

3. In combination, an arm supporting means adapted to be rotated, a plurality of arms on said means and having cam slots to guide them, a guide for said means having means engaging said cam slots, means for permitting of relative movement between said cam slot engaging means and said arms while guiding said arms, and roller means on the ends of said arms for extruding a metal sheet and rolling a metal sheet.

4. In combination, a rotatable arm supporting means, a plurality of arms mounted thereon depending therefrom, a guide for the supporting means having means engaging said arms to guide them downwardly and outwardly, and extruding and rolling rollers mounted on the ends of said arms, said guide means comprising stationary pins engaging cam slots in said arms.

5. In combination, a rotatable arm supporting means, a plurality of arms mounted thereon depending therefrom, a guide for the supporting means having means engaging said arms to guide them downwardly and outwardly, and extruding and rolling rollers mounted on the ends of said arms, said guide means comprising stationary pins engaging cam slots in said arms, said rollers having extrusion portions and rolling portions.

6. In combination, an arm supporting sleeve, a support for said sleeve, a plurality of depending arms pivotally mounted on said sleeve, metal engaging means mounted on said arms, said arms having cam slots therein, a metal holding means on said support, a plurality of pins mounted thereon for engaging each of said slots, and means for yieldingly resisting the movement of said arm supporting sleeve and support with respect to one another.

7. In combination, an arm supporting sleeve,

a support for said sleeve, a plurality of depending arms pivotally mounted on said sleeve, metal engaging rollers mounted on said arms, said arms having cam slots therein, a metal holding means on said support, a plurality of pins mounted on said support for engaging each of said slots, and means for yieldingly resisting the movement of said arm supporting sleeve and support with respect to one another.

8. In combination, an arm supporting sleeve, a support for said sleeve, a plurality of depending arms pivotally mounted on said sleeve, metal engaging rollers mounted on said arms, said arms having cam slots therein, a metal holding means on said support, a plurality of pins mounted on said support for engaging each of said slots, means for yieldingly resisting the movement of said arm supporting sleeve and support with respect to one another, and ball bearing means between said holder and pins in the slots.

9. In combination, a conical form having a straight wall surface, an arm supporting sleeve, means to rotate the sleeve, a plurality of pivotally mounted depending arms on said sleeve, means to guide said arms so that the ends thereof will travel substantially parallel to the surface of said form, rollers mounted on said arms adapted to rotate with their major plane at substantially right angles to their bodily movement downwardly over said form.

10. In combination, a conical form having a straight wall surface, an arm supporting sleeve, means to rotate the sleeve, a plurality of pivotally mounted depending arms on said sleeve, means to guide said arms so that the ends thereof will travel substantially parallel to the surface of said form, rollers mounted on said arms adapted to rotate with their major pins at substantially right angles to their bodily movement downwardly over said form, a holding means mounted on said form for holding a sheet of metal thereon, telescopic means connecting said holding means with said arm supporting sleeve and yielding means therebetween.

11. In combination, a stem, an arm supporting sleeve, a plurality of depending arms pivoted on said sleeve having cam slots, a collar having pins engaging said slots, a form adapted to support said collar and take the thrust axially therefrom, and yielding means between said collar and said sleeve for imparting said thrust, and extruding and forming rollers mounted on the ends of said arms so arranged that they will travel downwardly in a substantially straight line over the surface of the form while rotating bodily therearound and upon their own axes.

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