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STRIPPER MECHANISM

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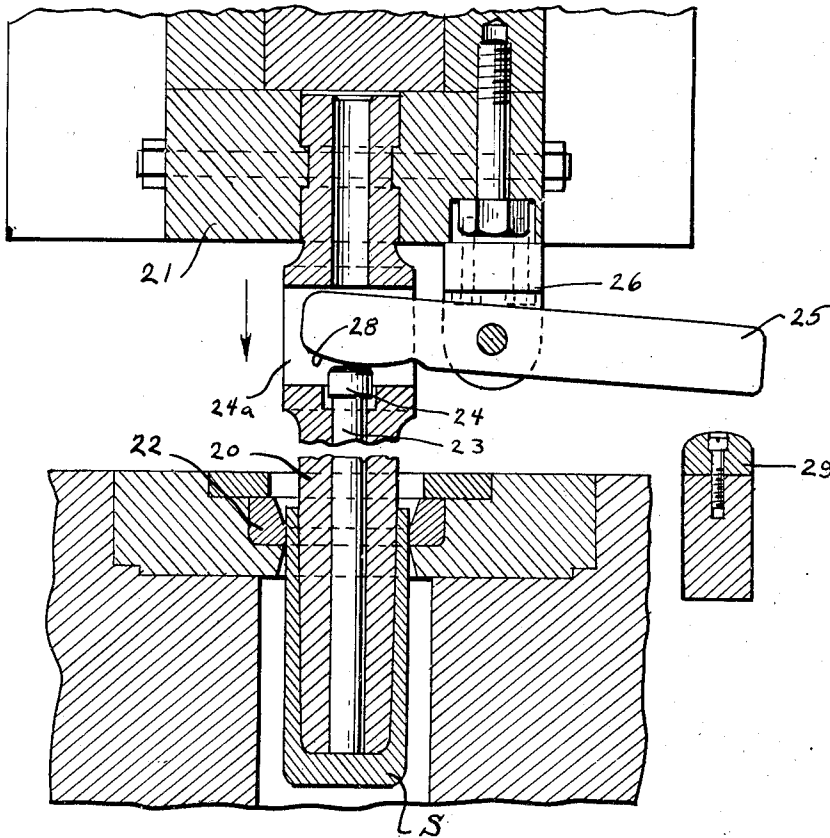


Fig. 1

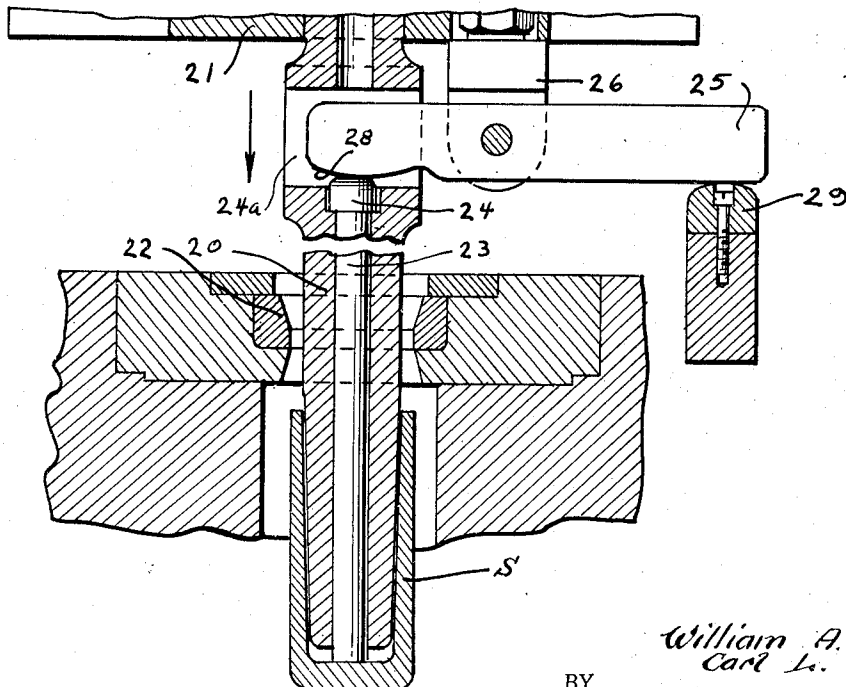


Fig. 2

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STRIPPER MECHANISM

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6 Claims. (Cl. 205—4)

This invention relates to stripper mechanism and has particularly to do with such a mechanism for metal drawing machinery and processes used in the manufacture of hollow articles.

As near as can be ascertained from general investigation in the industry and from patent searches, there is a limited number of stripper mechanisms, each of which has proved unsuccessful in the solution of the problem herein dealt with.

Specifically the problem is the removal of steel artillery shell cases from the punch member after the forming operation. There is apparently a shrinkage fit which takes place between the steel case and the punch so that it binds itself firmly thereto. The ordinary stripper used for brass shell cases consisting of fingers to catch the top edge of the shell was unsuccessful. This stripper (Patent No. 2,298,887) actually tore the edges of the shell case before removal could be instituted. Other devices used in the toothpaste tube art consisting of pneumatic or hydraulic pressure removal were unsatisfactory due to the enormous pressures necessary to do the job. Handling of such pressures in a movable part was impractical.

Briefly, the object of the present invention is the provision of an internal plunger within the punch which, when retracted, forms a part of the punch operating surface. Upon movement of the punch into the die means is provided to shift the plunger out of the punch near the end of the stroke to release the shell. This relative movement between the punch and plunger is arranged to take place while the punch is actually moving into the die. A bottomless die may be used so that the shell removal involves no additional step in the manufacturing process.

Other objects and features of the invention having to do with details of construction and operation may be found in the following description and claims.

In the drawing:

Fig. 1 illustrates the stripper mechanism in a punch and die with shell in place.

Fig. 2 shows the operation of the stripper mechanism at a point near the end of the stroke.

With reference to the drawing, a die punch 20 on a ram 21 is shown cooperating with a lower die ring 22 in the formation of a shell S. The punch 20 is slightly tapered.

Within the punch is an axial plunger 23 slidably movable. A head 24 limits the outward movement. In the position shown the end of plunger 23 forms part of the end of the punch. The punch is cut transversely as at 24a. On the

ram 21 there is pivotally mounted a bar 25 by a depending lug 26. This bar passes into the transverse opening 24a to cooperate with the head 24. Note the curved surface 28. This surface is essential to permit the rocking action of a bar 25 on head 24, thus insuring positive pressure during the stroke.

A stop 29 cooperates with the outer end of bar 25 as the ram descends to pivot the bar and push plunger 23 down relative to the punch 20. This starts the stripping action and permits the shell S to drop through the die 22. The stop 29 is solidly mounted in the relative position shown.

The actual stripping distance necessary for each particular job may be easily worked out. Then the lever 25 may be varied in length and stroke to bring about the necessary movement.

We claim:

1. A stripper mechanism for deep drawing to be used in a bottomless die, which comprises a punch arranged to have a forward working stroke and a retraction stroke, means to receive the punch, an axial plunger slidably mounted in the punch and adapted to project beyond the forward surface thereof and means for causing relative movement between said plunger and said punch in response to relative movement between said punch and said punch receiving means during the forward working stroke.

2. A stripper mechanism for deep drawing to be used in a bottomless die, which comprises a punch arranged to have a forward working stroke and a retraction stroke, means to receive the punch, an axial plunger slidably mounted in the punch and adapted to project beyond the forward surface thereof and means for causing relative movement between said plunger and said punch in response to relative movement between said punch and said punch receiving means during the forward working stroke, said last named means comprising a lever mounted adjacent said punch having a portion projecting into an opening in said punch and means adjacent said punch for contacting and shifting said lever upon movement of the punch in the working stroke.

3. A stripper mechanism for deep drawing a ram operated punch which comprises a punch member provided with an axial and a transverse opening, a plunger to slide in said axial opening, a lever to project into said transverse opening, means for mounting said punch and said lever on a ram and means for contacting one end of said lever while the same is moving with the punch in the working stroke to shift the lever

relative to the punch to cause sliding movement of said plunger.

4. A stripper mechanism for deep drawing comprising two cooperating die members having relative movement in working and retraction strokes, means mounted in one of said die members adapted to form one of the contacting surfaces of the dies and adapted upon movement to shift outwardly from said surface and means operable in response to relative movement between said die members in the working stroke to cause the projection movement of said first named means.

5. A stripper mechanism for deep drawing for a ram operated punch which comprises a reciprocating punch member arranged to operate in a working stroke and a retraction stroke provided with an axial and a transverse opening, a plunger to slide in said axial opening, a lever

to project into said transverse opening, a curved surface on said lever adapted to rock on the end of said plunger, means for mounting said punch and said lever on a ram and means for contacting one end of said lever while the same is moving with the punch in a working stroke to shift the lever relative to the punch to cause sliding movement of said plunger.

6. The method of stripping shells from a die member which comprises providing a plunger within the member capable of relative movement with the die member and utilizing energy of the working stroke of the die adjacent the end of the stroke to cause relative shifting of said plunger to effect stripping of a shell from the die member.

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