

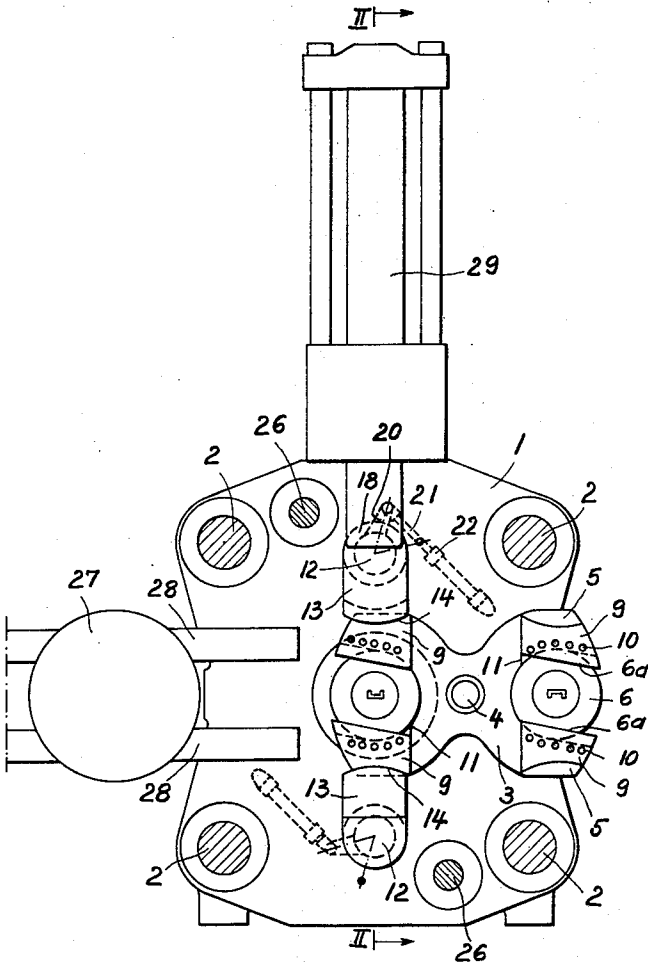
[54]	DIE MOUNTING MEANS	2,728,453 12/1955 Thweatt.....72/263
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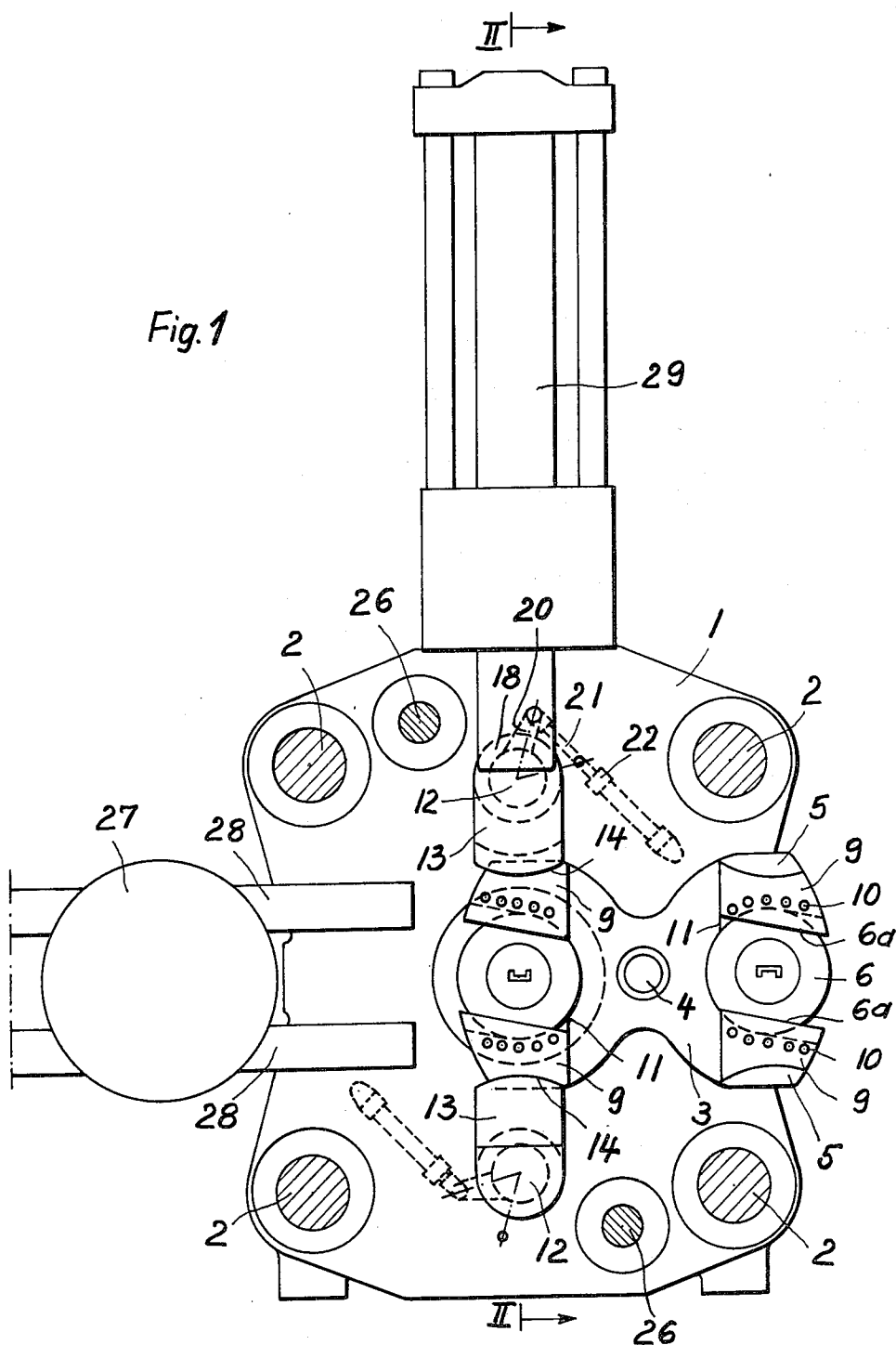
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ABSTRACT

In a metal extrusion press for both sections and tubing a die means is rotatably mounted, but axially fixed with respect to the axial direction of the press, on a front platen. Locking means, preferably in the form of two shafts extending in the axial direction of the press, are pivotably mounted but axially fixed on the front platen, and engagement members extend perpendicularly from each locking means, so that pivotal movement causes the engagement members to engage the die mounting means at opposite sides to prevent both axial and rotary movements of the die and to permit access of a saw or shear for cropping an extrusion.

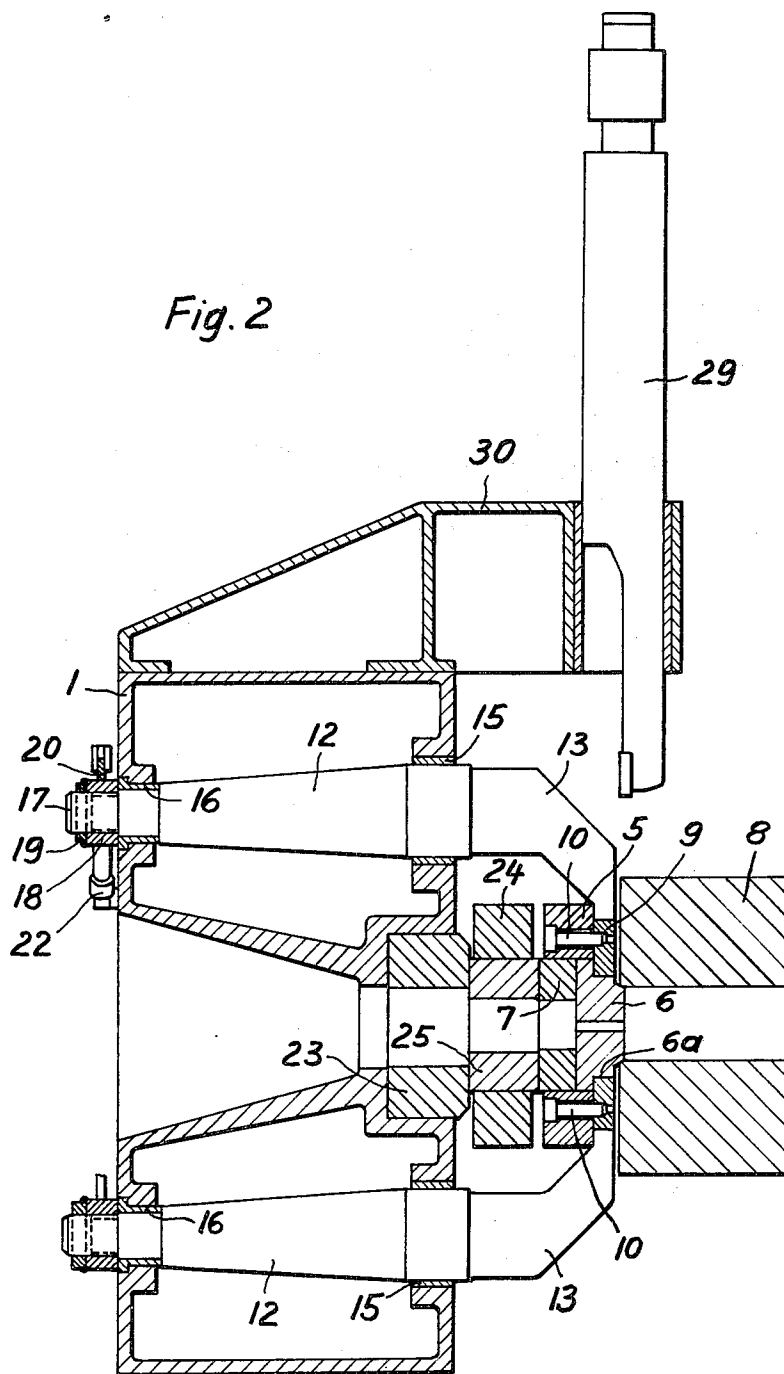
6 Claims, 2 Drawing Figures





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Fig. 2



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DIE MOUNTING MEANS

BACKGROUND OF THE INVENTION

This invention relates to die mounting means and improvements therein in which a front platen is provided with die mounting means and means for locking the die mounting means with respect to the front platen.

The invention is particularly applicable to hydraulic metal and tube extrusion presses in combatting the problem of axial or rotary movement of the die mounting means, such as a rotary arm having provision for mounting two dies only one of which is in an operating position, about an axis parallel to the axis of the press; the rotary arm is rotatably mounted on the front platen. Usually an axial pusher device for a billet container is provided and a shear and saw are arranged for cropping the discard end from the extrusion being provided on the front platen. Either the shear or the saw is used depending on the particular extrusion and its material.

In order to lock the die mounting means in position for preventing axial lifting movements along the axis of the press and rotary movement when the extrusion is sheared or cropped, in the past the front platen of a metal extrusion press has been provided with a bolt which slides in guides extending perpendicularly from the axis of the press. The bolt has a fork-shaped head which is located adjacent the die mounting means, which is in a working position with the die, with the forked shaped head engaging with a forked end of the die mounting means so as to prevent a rotary motion. At the same time the bolt grips about the die mounting means so as to overlap it and prevent an axial movement with respect to the front platen.

This bolt is very heavy in design and is made of cast steel. It has the particular disadvantage of taking up a good deal of space at the inner side of the front platen. It is therefore a difficult matter, in the case of metal and tube extrusion presses on whose front platen there is provided both an axial pusher member for the block container and shear and saw devices for cropping the discard end from the extrusion, particularly to arrange the saw device in such a manner that it can cut through the extrusion with a corresponding large saw blade diameter while being easily accessible.

SUMMARY OF THE INVENTION

According to the present invention, there is provided a front platen for a hydraulic metal and tube extrusion press having an axis of extrusion, comprising means displaceably mounted on the front platen a die, the fixedly mounting means being displaceably mounted on the front platen and means for securing the die mounting means to the front platen, the curving means comprising members pivotably mounted on the front platen about an axis extending substantially parallel to the axis of extrusion, the two members being pivotable in opposite rotary directions to engage the die mounting means at opposite sides to secure it with respect to the front platen.

The pivotably mounted member comprises a shaft extending parallel to the axis of extrusion, with the shaft being rotatably mounted on the front platen but fixed with respect to its axial direction, and an arm extending substantially parallel thereto providing the engagement portion at its free end.

The die mounting means has a forked end having inner faces curved to abut a die, and a locking segment mounted on the forked end so as to engage the die from opposite sides to prevent rotation thereof, and at least one locking segment being arranged to be engaged by the engagement portion of the pivotable locking member.

The present invention can provide a locking system for die mounting means, such as a rotary die arm which is located on the front platen and can prevent axial and rotary movement of the rotary die arm, the device requiring less space and being simpler in design than previous devices and, moreover, allowing the saw which is arranged to crop off the discard from the extrusion to be arranged on the front platen in such a manner as to be easily accessible.

The face of the engagement portion of the pivotable locking member (or members) is preferably circularly convex having a radius extending from the axis about which it is pivotably mounted.

If the device of the invention is used for locking a rotary arm forming a die mounting means of a metal and tube extrusion press, an axial lifting or a rotary movement can be prevented, and substantially more space is saved than in previous arrangements.

In horizontal metal and tube extrusion presses having the locking means according to the present invention, when the locking means are mounted on shafts which are able to rotate in the front platen while remaining axially fixed, the locking means are arranged in a plane at right angles to the axis of the press. The cropping saw is now caused to approach from the side of the press towards the extruded material and is made horizontally slidable. The center point of the saw is guided along an axis at right angles to the axis of the press. The design of the saw is thus symmetrical and the saw may be inserted in the press from the righthand or lefthand side.

There can be sufficient space between the columns of the press for saw blades of a large enough size to be used for cutting through extrusions of larger circumference. This space in the past was occupied by the heavy bolt which moved along a slideway horizontally on the front platen.

The locking means according to the present invention are moreover substantially lighter than the sliding bolt with the supporting block, guide and stay member used hitherto. When the locking means are members mounted on shafts to be pivotably movable into abutment against the die mounting means, substantially less power and time is required to effect the locking than is required in the sliding movement of a heavy bolt at right angles to the axis of the press. There is also no longer any need for a brake block.

The segment is formed from plates which are releasably secured on the forked ends of the die mounting means at the side arranged to be nearer a billet container, such that one face overlaps the fork of the die mounting means in a direction towards the die while the other face, which is that adjacent to the locking members has an abutment surface corresponding to that of the locking member, with the fork overlapping the segment in a direction extending away from the die. A die holder can be further secured in the die mounting means of the inwardly overlapping segment so as to be secured against rotation in that the die holder or die is provided on its side adjacent the container with straight butting edges, by means of which they are guided on the straight inner surfaces of the segments so as to be fixed against rotation. With this design, it may no longer be necessary to secure the die holder or die against rotation in the fork of the die mounting means by means of pins or the like.

The pivotal movement of the shafts of the locking means, which pass through the front platen can be advantageously caused by drive members acting through levers which are secured so as to be fixed against rotation on the ends of the shafts on the outside of the front platen, with the drive members being pivotally connected of the levers. The drive members can be hydraulically actuated piston and cylinder units articulated to the front platen or on the locking means. The arrangement of the piston and cylinder units on the outside of the front platen removes them from the inside of the container.

Further advantages which may be obtained by use of the locking system of the invention lie in the fact that because of the space saved on the front platen, it is no longer necessary to loosen the bolt before severing the extrusion adjacent the die, as was hitherto necessary with the heavy sliding bolt. Moreover, the bases of, for example, horizontal tube and extrusion presses having a front platen carrying a shear, may be made simpler and more robust because it is no longer necessary to provide a break in the base for the saw which conventionally moved vertically upwards. A lateral arrangement of the saw is, moreover safer, because a dummy block pushed

out of the container no longer falls on to a moving saw, constituting a danger to operators.

Moreover, since sufficient space is now available between the lower columns of horizontal extrusion presses, it is also possible sufficiently to protect the linkage of the container drive arranged in the front platen against dummy blocks which may fall out. There is no longer any need for a separate side take-off for the dummy blocks and discards since the absence of a saw below the press means that the dummy block and discard can now be allowed to drop down off the press once they have been severed and thrust out of the container.

BRIEF DESCRIPTION OF THE DRAWINGS

An embodiment of the invention will now be described with reference to the drawings, in which:

FIG. 1 is a view of the inside of the front platen of a horizontal hydraulic metal extrusion and tube extrusion press with a saw and shear device located on the front platen and a linkage connecting it to a container drive system; and

FIG. 2 is a longitudinal section along the line II—II of FIG. 1 through the front platen and part of the billet container.

DETAILED DESCRIPTION OF THE DRAWINGS

A front platen 1 is connected by columns 2 to a cross-head (not shown) of a horizontal metal and tube extrusion press. A two-armed rotary die arm 3 is rotatably mounted on a shaft 4 which is mounted in a horizontal plane extending parallel to the axis of the press, with the rotary die arm 3 being fixable to prevent rotation. In forked ends 5 of the rotary die arm 3 are secured dies 6, each with a die bolster 7. At the side of the rotary die arm 3 adjacent to a billet container 8, plate-shaped segments 9 are secured to each of the forked ends 5 by means of bolts 10 and abut against a butting edge 11 of the rotary die arm in such a manner as to overlap the inner edges of the forked portions of the rotary die arm 3. The segments are set back on the outer edge of the fork. The die 6 has butting edges 6a by means of which it abuts on the straight inner edges of the segments 9 so as to be fixed against rotation.

Two shafts 12, which are able to rotate but are axially fixed, are arranged in the front platen 1 so as to be symmetrical about and parallel to the axis of the press; the ends of these shafts being located on the inside of the front platen are in the form of lever arms 13. These lever arms 13 have on their faces adjacent the segments 9 a convex edge 14 which is circular radiused on the axis of pivoting, by means of which they are able to pivot in to form a lock with the segments 9, simultaneously gripping the forked ends 5 of the rotary die arm. The side of the segments 9 adjacent to the lever arms 13 corresponds to the circular shape of the edge 14 of the lever arms 13.

The shafts 12 in the front platen 1 are able to rotate in bearings 15 and 16 but are not able to slide axially and carry on a stub shaft 17 nuts 18 secured thereto. These are fixed against rotation of the stub shaft 17 by means of locking plates 19 which are arranged in a slot in the stub shaft 17 and welded to the nuts 18. Levers 20 are welded to the nuts 18. A piston rod 20 of a hydraulically actuated piston and cylinder unit 22 is articulated to the free ends of these levers 20 while the cylinder of this unit 22 is articulated to the outside of the front platen 1. These piston and cylinder units 22 act, through the shafts 12, to pivot the lever arms 13 into the vicinity of the rotary die arm 3 which is located in extruding position so as to lock it in this position on the front platen 1.

Another thrust member 23 is built into the front platen 1 adjacent the axis of the press and against this there abuts a thrust plate 25 which is secured in a rotary arm 24. In addition, a further billet container drive system which is not shown in the drawing is arranged on the front platen 1. Push rods 26 of this drive system, which are connected to the container 8, extend through the front platen 1. A saw device 27 is arranged between the columns 2 on the front platen 1 so as to be able to

slide sideways into the axis of the press; this saw slides on a slideway 28 in a simple manner to crop the discard. The outer ends of the lever arms 13 are designed to allow the saw to cut off the discard from the extrusion adjacent the die 6 without a pivotal movement. A hydraulically actuated shear 29 which acts vertically with respect to the axis of the press is secured to the front platen 1 by means of a casing 30.

We claim:

1. A front platen for a hydraulic metal and tube extrusion press having an axis of extrusion, comprising means for fixedly mounting a die, said fixedly mounting means being displaceably mounted on the front platen, and means for securing the die mounting means to the front platen, the securing means comprising two members pivotably mounted on the front platen about an axis extending substantially parallel to the axis of extrusion, the two members being pivotable in opposite rotary directions to engage the die mounting means at opposite sides to secure it with respect to the front platen.

2. A front platen for a hydraulic metal and tube extrusion press having an axis of extrusion, comprising means for fixedly mounting a die, said fixedly mounting means being displaceably mounted on the front platen, and means for securing the die mounting means to the front platen, the securing means comprising two members arranged to engage the die mounting means at opposite sides, and at least one of the two members being pivotably mounted on the front platen about an axis extending substantially parallel to the axis of extrusion, whereby the pivotably mounted member is movable to engage the die mounting means to secure it with respect to the front platen, said pivotably mounted member comprising a shaft extending parallel to the axis of extrusion, the shaft being rotatably mounted on the front platen but fixed with respect to its axial direction, and an arm extending substantially parallel thereto providing the engagement portion at its free end.

3. The front platen as claimed in claim 2, wherein the shaft is arranged to be pivotably moved by drive members acting a lever which is secured against rotation on the end of the shaft on the outside of the front platen, with the drive members being pivotably connected to said lever.

4. A front platen for a hydraulic metal and tube extrusion press having an axis of extrusion, comprising means for fixedly mounting a die, said fixedly mounting means being displaceably mounted on the front platen, and means for securing the die mounting means to the front platen, the securing means comprising two members arranged to engage the die mounting means at opposite sides, and at least one of the two members being pivotably mounted on the front platen about an axis extending substantially parallel to the axis of extrusion, whereby the pivotably mounted member is movable to engage the die mounting means to secure it with respect to the front platen, said die mounting means comprising an arm pivotably mounted on the front platen about an axis extending substantially parallel to the axis of extrusion, and said die mounting means having a forked end having inner faces curved to abut a die, and a locking segment mounted on said forked end so as to engage the die from opposite sides to prevent rotation thereof, and at least one locking segment being arranged to be engaged by the engagement portion of the pivotable locking member.

5. The front platen as claimed in claim 3, wherein the face of the engagement portion of the pivotable locking member or members is circularly convex having a radius extending from the axis about which it is pivotably mounted.

6. The front platen as claimed in claim 4, wherein the segments are formed from plates and are releasably secured on the forked ends of the die mounting means at the side arranged to be nearer a billet container, such that one face overlaps the fork of the die mounting means in a direction towards the die while the other face, which is that adjacent to the locking member, has an abutment surface corresponding to that of the locking member, with the fork overlapping the segment in a direction extending away from the die.

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