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F. EBEN ET AL

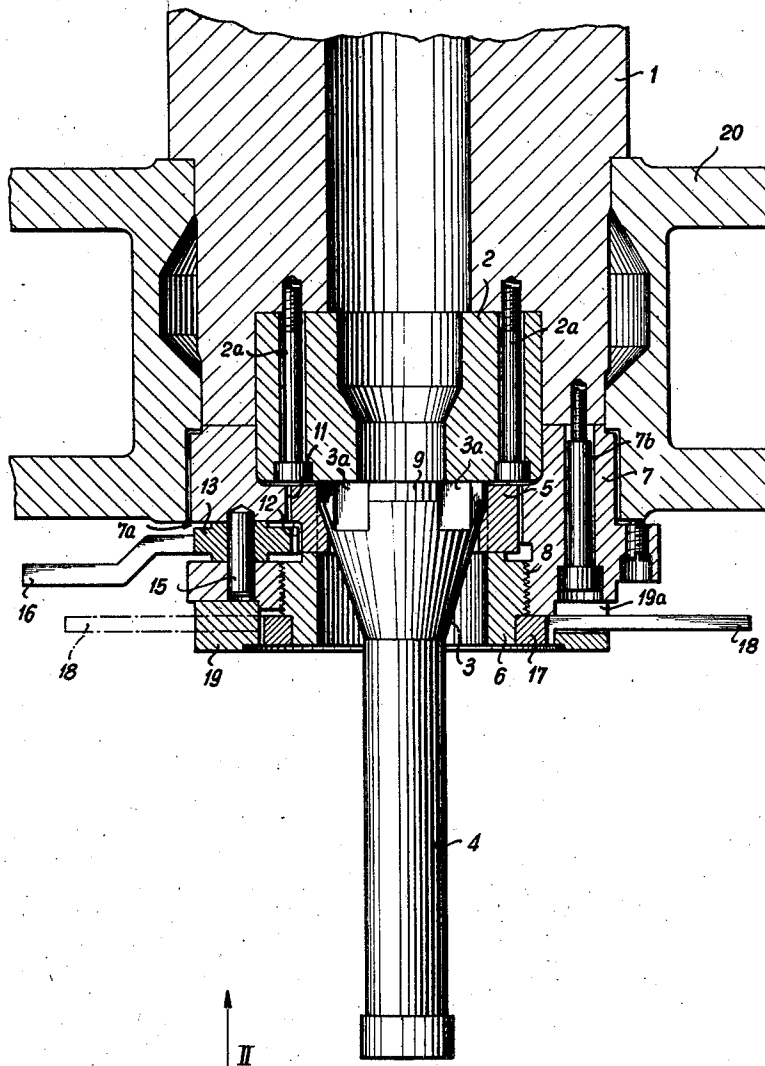
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ARRANGEMENT FOR SECURING A PRESS RAM TO A PRESS PLUNGER

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3 Sheets-Sheet 1

FIG. 1



INVENTORS

F. Eben

W. Hofmann

W. Pirwitz

W. P. Pirwitz
By *W. P. Pirwitz* Subscribed
ATTYS

ATTYS

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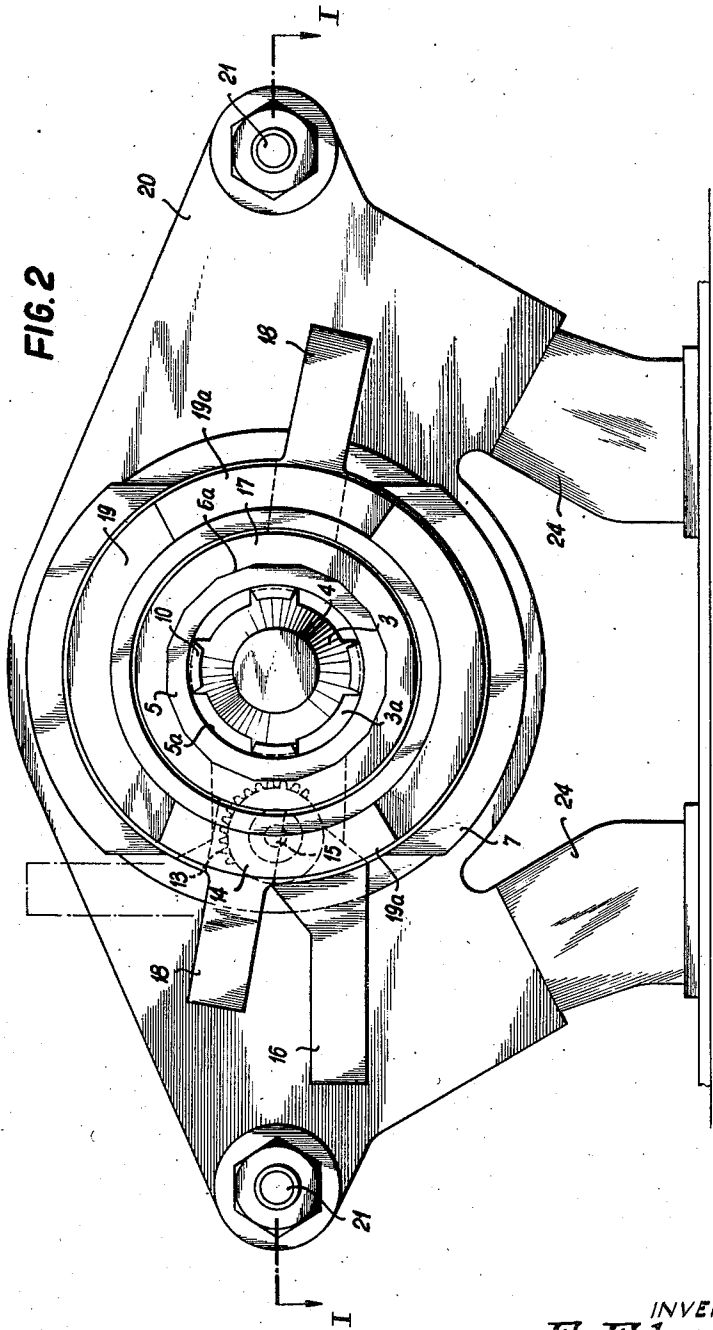
F. EBEN ET AL

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INVENTORS
F. Eben
W. Hofmann
W. Pirwitz
By Glascock Downing Seibels
ATTYS.

Jan. 28, 1958

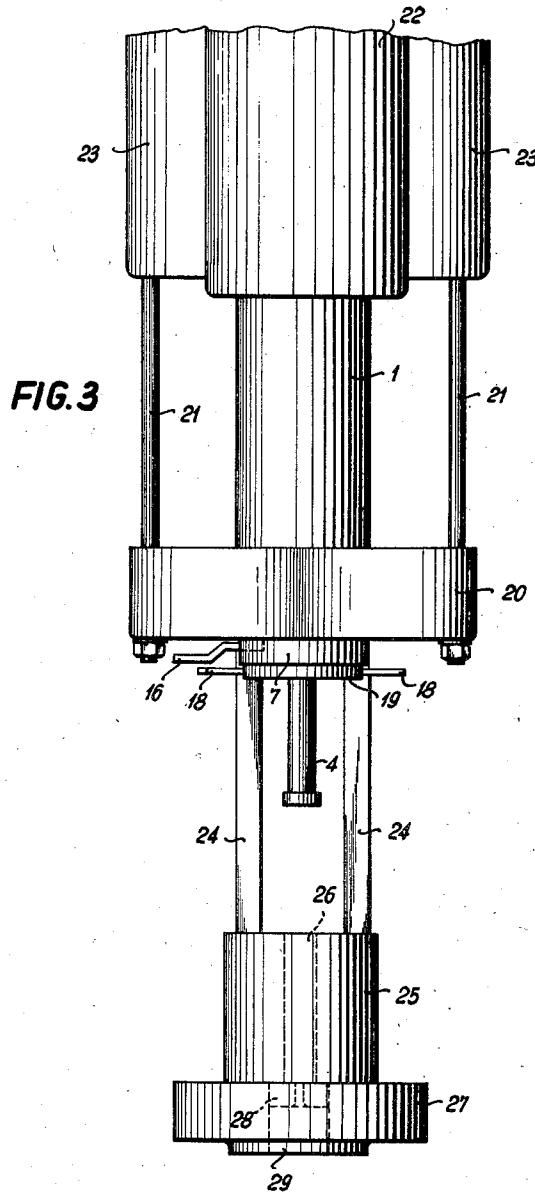
F. EBEN ET AL

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INVENTORS

F. Eben

W. Hofmann

W. Pirwitz

By *Glascok & Downing* *Seibold*
ATTYS.

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ARRANGEMENT FOR SECURING A PRESS RAM TO A PRESS PLUNGER

Franz Eben, Dusseldorf, Wilhelm Hofmann, Dusseldorf-Oberkassel, and Wilhelm Pirwitz, Ratingen, Germany, assignors to Schloemann Aktiengesellschaft, Dusseldorf, Germany

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8 Claims. (Cl. 279—1)

The insertion and removal of the press ram of presses takes such a long time, more especially in the case of horizontal presses, that it is found that changing the ram gives rise to a disadvantageous stoppage of work. The object of the invention is to shorten the working time necessary for changing the ram, and the invention consists primarily in this, that the (preferably conically shaped) foot of the ram, which bears against the plunger, has two or more longitudinal grooves co-operating, in the manner of a bayonet joint, with a securing ring adapted to be pressed against the plunger.

So that it will not be necessary to rotate the heavy ram, suspended from a crane, about its longitudinal axis when it is being inserted or removed, the bayonet joint is so formed that the securing ring is rotatable about the axis of the ram.

Particular reliability of operation is obtained if the securing ring is freely rotatable on the plunger and is pressed against the foot of the ram by a nut adapted to be screwed in on the plunger. To enable the securing ring to be rotated, a slot-shaped opening is provided for introducing a handle by means of which the securing ring can be rotated.

It is particularly advantageous to use a handle which also permits an increase of force by gearing. This can be done in such a manner that the securing ring has external teeth in which pinion teeth engage which are adapted to be moved pivotally by hand or hydraulically. The pinion teeth may be actuated by means of a lever by hand, or else hydraulically, or by means of a magnet or in some other manner.

One embodiment of the invention chosen by way of example is illustrated in the accompanying drawings, in which:

Figure 1 is an axial horizontal section through a press crosshead having a ram inserted therein, on line II—II of Figure 2,

Figure 2 is a view in elevation, seen in the direction of the arrow I of Figure 1, and

Figure 3 is a plan view of a press provided with the arrangement according to the invention.

Figure 1 shows a press ram 4 secured to a press plunger 1. Both parts are supported by the travelling crosshead 20 of the press. The travelling crosshead also slides on tracks 24. The rear end of the plunger 1 slides in a press cylinder 22 and is forced out of the latter in a known manner, oil or water being forced under pressure into the cylinder 22. The withdrawal of the plunger 1, and of the travelling crosshead 20 which is virtually integral therewith is effected by means of pistons not shown in the drawing, which are arranged in the returning cylinders 23 and connected through rods 21 to the travelling crosshead 20 to which they are secured by screws. When the plunger 1 is advanced the ram 4 enters the bore 26 of a container 25 in which there is material for extrusion, for instance heated aluminium. This material then passes through a die 28 located in the press head 27, and emerges

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at 29. For limiting the forward movement of the plunger 1 and the press ram 4 a stroke limiting ring 19 is used which abuts against the container 25 when the ram 4 has gone as far into the bore 26 as is necessary.

The arrangement described above is known.

A pressure body 2 against which the foot 3 of the press ram 4 bears forms part of the plunger 1, to which it is secured by means of screws 2a. The foot 3 together with a rotatable securing ring 5 forms a bayonet joint. A nut 6 screwed into a head piece 7, which also forms part of the plunger 1, by means of a thread 8 presses the securing ring 5 and therefore the foot 3 against the pressure body 2. The head piece 7 is held by the plunger 1 by means of a plurality of screws 7b of which only one is shown in the drawing. On the frusto-conically shaped foot 3 are four recesses 3a, between which four bearing surfaces 9 are thus left. The securing ring 5 has corresponding recesses 5a, between which inwardly extending claws 10 are left. The securing ring, which is rotatably mounted at 11, has on a part of its periphery toothed segments 12 in which teeth 13 of a pinion segment 14 engage. The pinion segment is rockable on a bolt 15 in a slot 7a of the head piece 7 and carries a hand lever 16. For rotating the nut 6 the projecting part of the latter is made polygonal, cf. 6a of Figure 2. A ring 17 formed as a wrench and capable of being rotated by means of two levers 18 is slid on to the polygonally shaped part. The levers project through slots 19a of the stroke limiting ring 19. For inserting and extracting the ram, therefore, the latter does not have to be rotated about its axis.

If the ram 4 is to be removed, first of all the nut 6 is loosened slightly by actuation of the hand levers 18, so that the securing ring 5 can be rotated with the aid of the pinion segment 13, the lever 16 being actuated by hand. After the securing ring has been rotated through 45° the ram can be drawn out forwards, i. e. downwards in Figure 1, and a new ram in the same angular position can be inserted. For securing the ram it is then only necessary to actuate the lever 16 and then the levers 18.

An advantage gained is that the stroke limiting ring 19 does not have to be removed when the ram is being changed, and more particularly, that the ram can be released from the plunger when it has seized in the container 25. In that case, the ram and the container are both removed, and a new ram and a new container are both inserted, so that the press is out of operation only for a short time. When rams are secured in the usual manner, the access to the head screws and nuts that have to be loosened is at the end face of the plunger 1, and therefore when the travelling cross-head 20 and the container 25 are close together access to said screws and nuts is difficult or impossible. Therefore, with the known constructions seizing of the ram in the container always causes a substantial interruption of work. Obviously, variations from the embodiment chosen by way of example are within the scope of the invention: thus for instance the securing ring 5 itself may be rotatable by means of a thread in the plunger or in the head piece 7. After the foot of the ram has been introduced, said ring is turned, from outside, through a part of one revolution, so that while rotating it is at the same time displaced longitudinally because of the thread, so that it presses the foot of the ram against the plunger or the pressure piece.

We claim:

1. Means for detachably securing a press ram to a plane end face on a press plunger, comprising: a rotatable securing ring surrounding the foot end of the press ram adjacent to the end face of the plunger, inwardly extending radial claws on the securing ring, bearing surfaces extending radially outwards from the foot end of the ram and adapted to pass in an axial direction through the recesses

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between the claws of the securing ring and to lodge behind the said claws when the securing ring is turned through a suitable angle, and an abutment member adapted to be screwed into the end of the plunger and to bear against the securing ring, urging it towards the plane end face of the plunger, and thereby pressing the end of the ram against the plane end face of the plunger.

2. Means for detachably securing a press ram to a plane end face on a press plunger as claimed in claim 1, the press plunger including a head-piece formed with an internal screw thread into which the abutment member is screwed, and the securing ring being rotatably supported within the head-piece by the abutment member.

3. Means for detachably securing a press ram to a plane end face on a press plunger as claimed in claim 2, further comprising a hand-lever for rotating the securing ring, the head-piece being formed with a slot-like aperture for the passage of the said hand-lever.

4. Means for detachably securing a press ram to a plane end face on a press plunger as claimed in claim 2, further comprising external teeth on the rotatable securing ring, a toothed pinion rotatably mounted in the head-piece and meshing with the said teeth, and a hand-lever for rotating the said pinion, the head-piece being formed with a slot-like aperture for the passage of the said hand-lever.

5. Means for detachably securing a press ram to a plane end face on a press plunger as claimed in claim 2, further comprising at least one hand-lever non-rotatably con-

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nected with the abutment member, and located outside the head-piece of the plunger.

6. Means for detachably securing a press ram to a plane end face on a press plunger as claimed in claim 5, further comprising a stroke-limiting ring mounted on the front of the plunger head-piece, this stroke-limiting ring being formed with at least one slot through which the hand-lever connected with the abutment member extends.

7. Means for detachably securing a press ram to a plane end face on a press plunger as claimed in claim 5, further comprising a stroke-limiting ring mounted on the front of the plunger head-piece, the hand-lever connected with the abutment being located outside this stroke-limiting ring.

8. Means for detachably securing a press ram to a plane end face on a press plunger as claimed in claim 1, the foot of the press ram being conically widened in the direction towards the plunger, and the claws of the securing ring being internally conical, so as to bear snugly upon the conical surface of the ram foot.

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