# United States Patent

**Huertigen**

[15] **3,653,247**

[45] **Apr. 4, 1972**


## [54] EXTRUSION PRESS


[72] Inventor: **Helmut B. Huertigen,** Pittsburgh, Pa.

[73] Assignee: **Sutton Engineering Company,** Pittsburgh, Pa.



[22] Filed: **Oct. 15, 1970**

[21] Appl. No.: **80,893**

[52] **U.S. Cl.** ..... **72/263,** 72/427

[51] **Int. Cl.** ..... **B21c 23/00,** B21d 45/00

[58] **Field of Search** ..... 72/263, 257, 427



[56] **References Cited**

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*Primary Examiner*—Charles W. Lanham

*Assistant Examiner*—R. M. Rogers

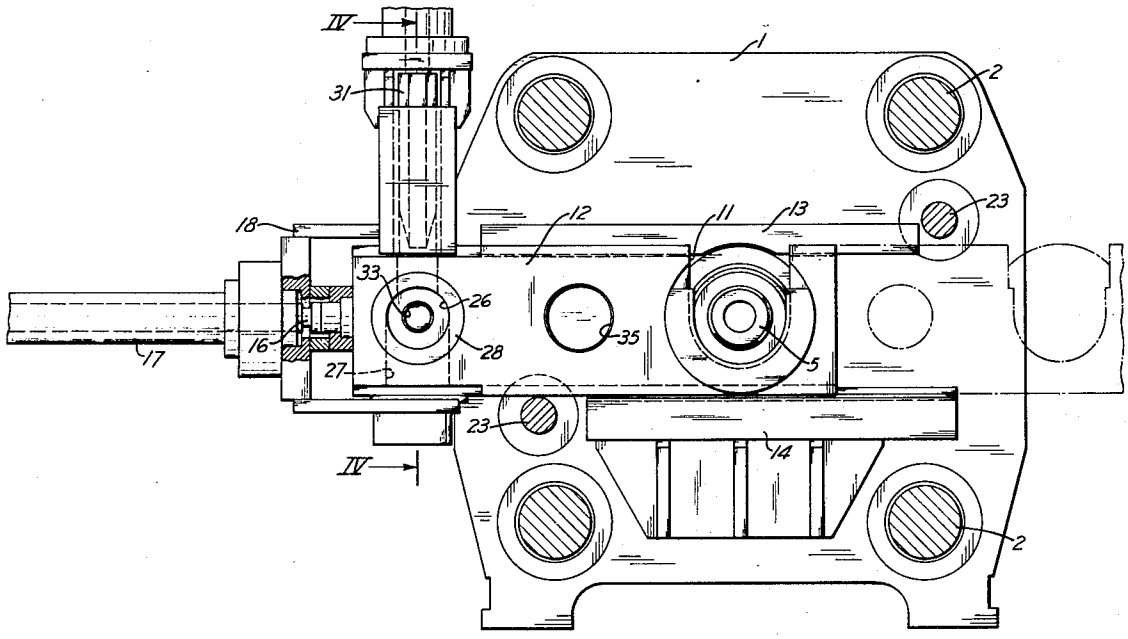
*Attorney*—Brown, Murray, Flick & Peckham



[57] **ABSTRACT**

An extrusion die, in front of a container for a billet and a dummy block, is carried by a horizontal slide. After an extrusion has been formed, the container can be retracted to permit the extrusion to be cut off between the container and die. The slide is provided with a rearwardly opening recess spaced laterally from the die, and with a vertical passage intersecting the recess. The slide is movable horizontally in one direction after the container is retracted, to locate the recess in front of the container for receiving the dummy block and remains of the billet from the container. After the slide has been returned to its original position a vertical ram is moved down through the vertical passage to eject the dummy block from the bottom of the slide, and then a horizontal ram is moved rearwardly through the recess to eject the remains of the billet from the back of the slide.


**5 Claims, 10 Drawing Figures**



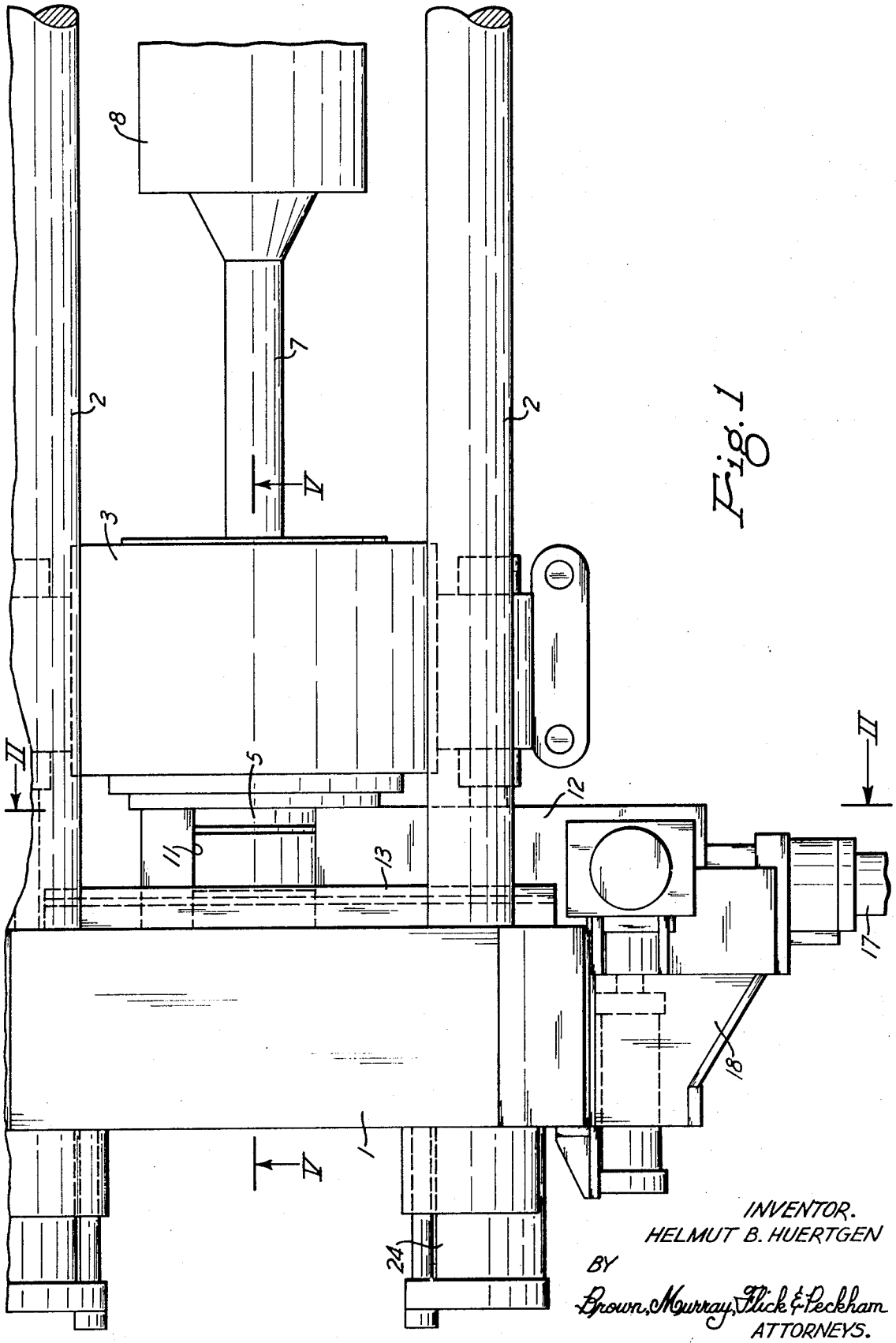



Fig. 1

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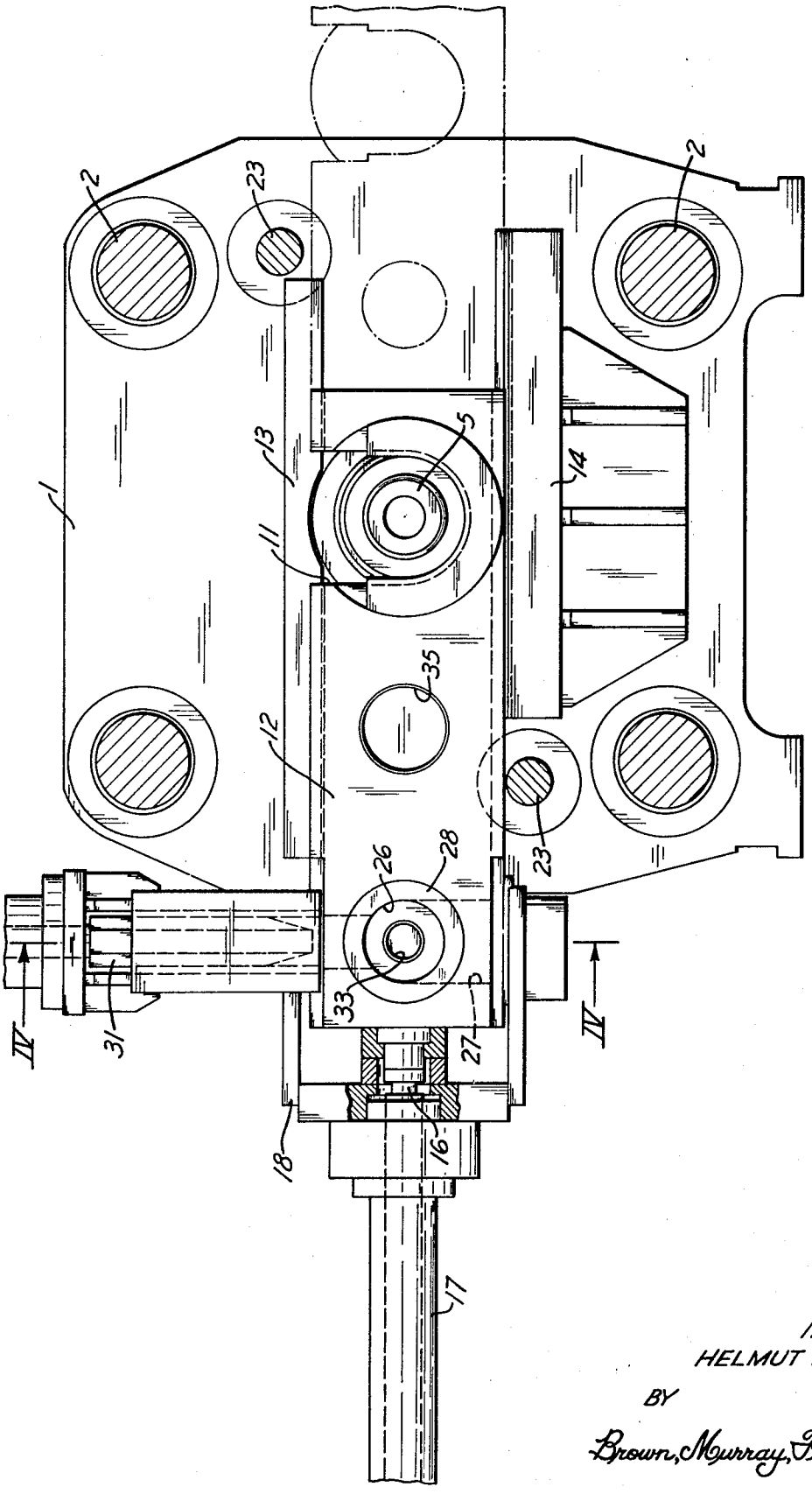



Fig. 2

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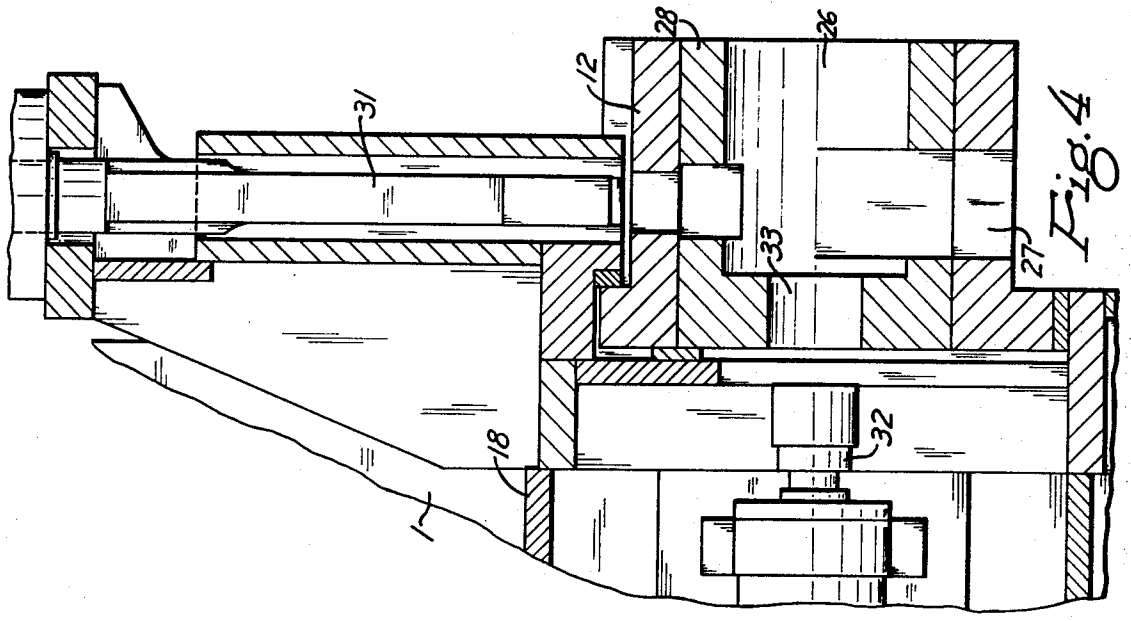



Fig. 4

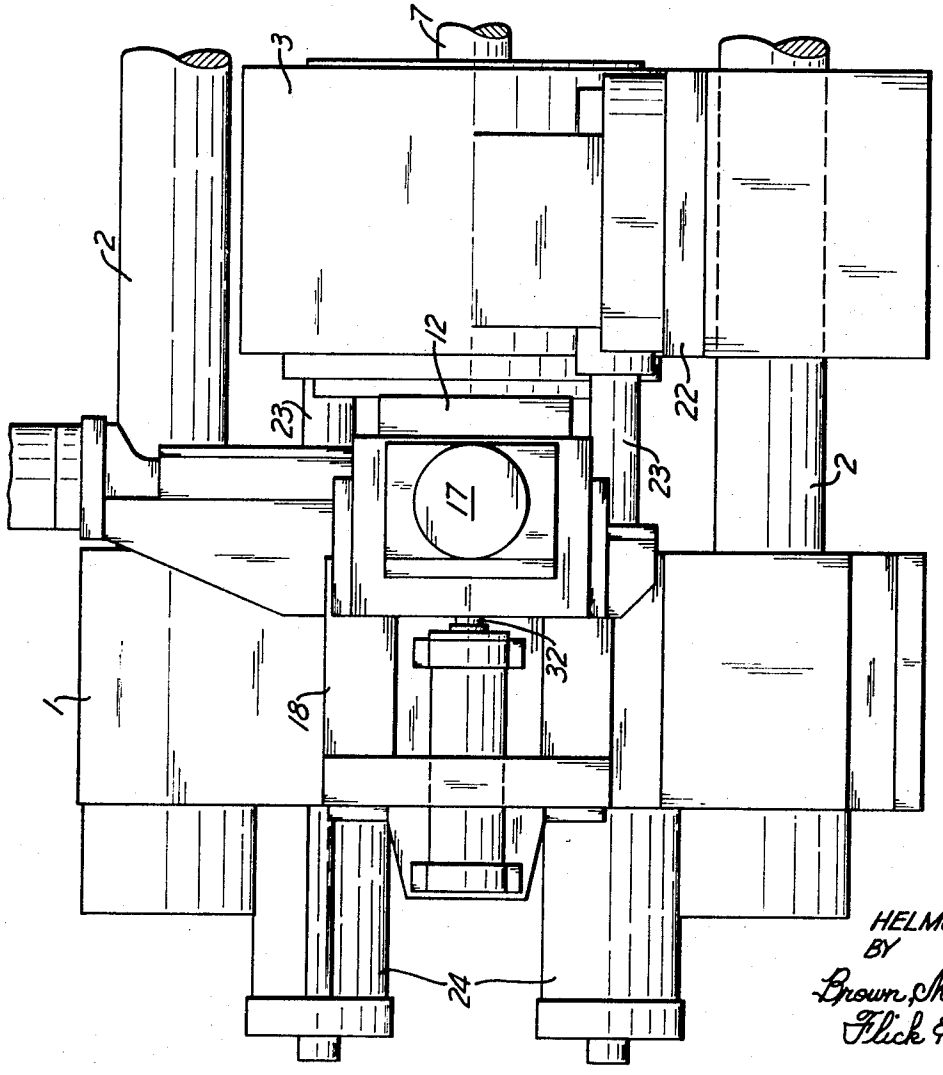



Fig. 3

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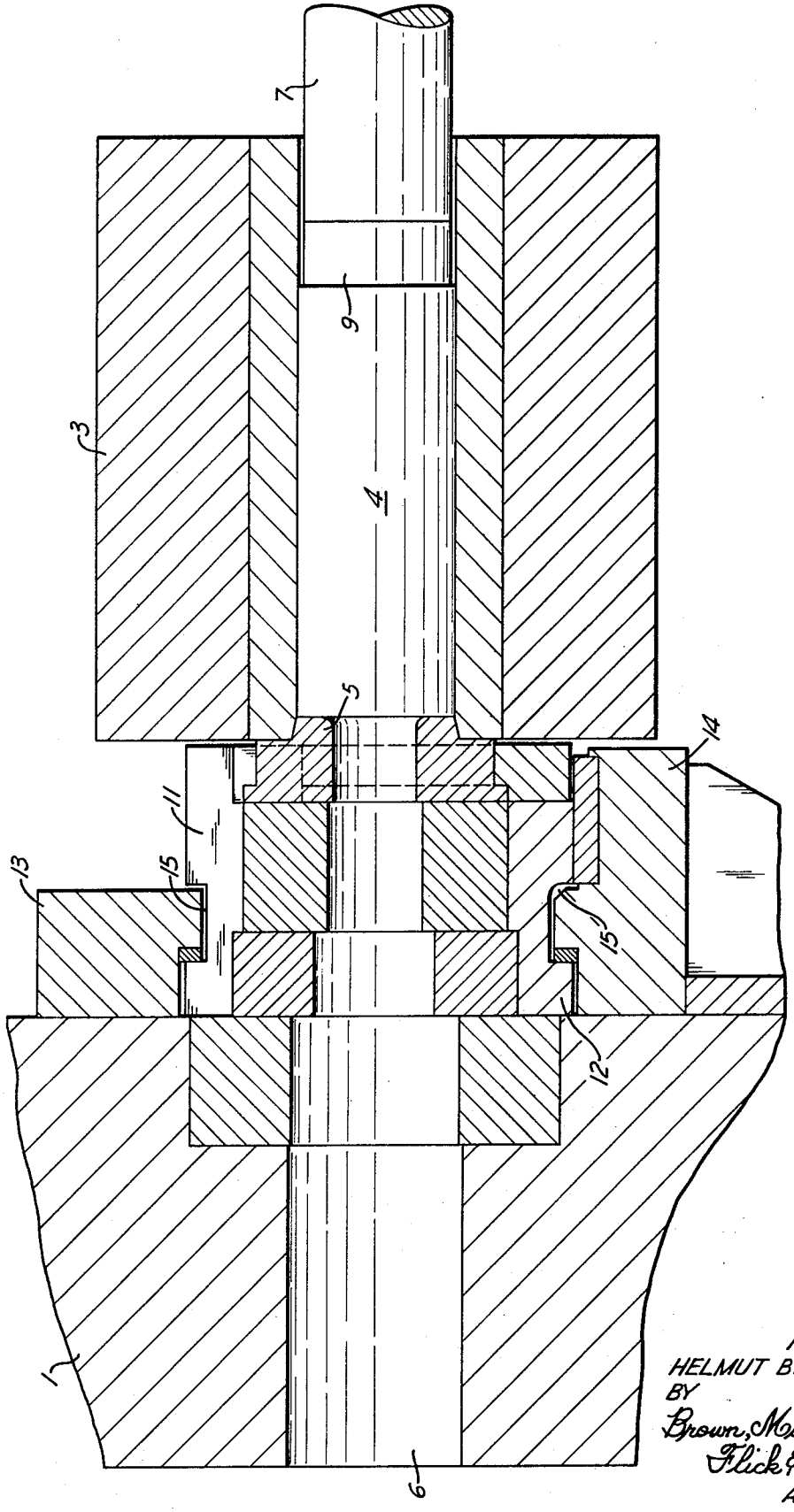



Fig. 5

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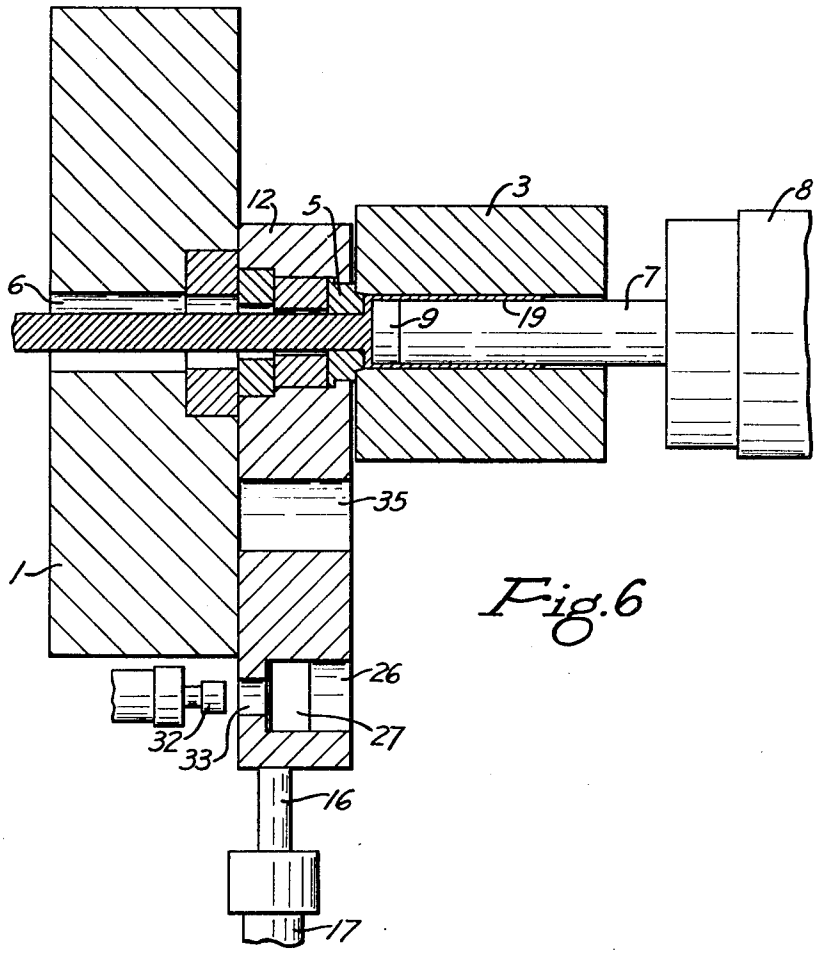



Fig. 6

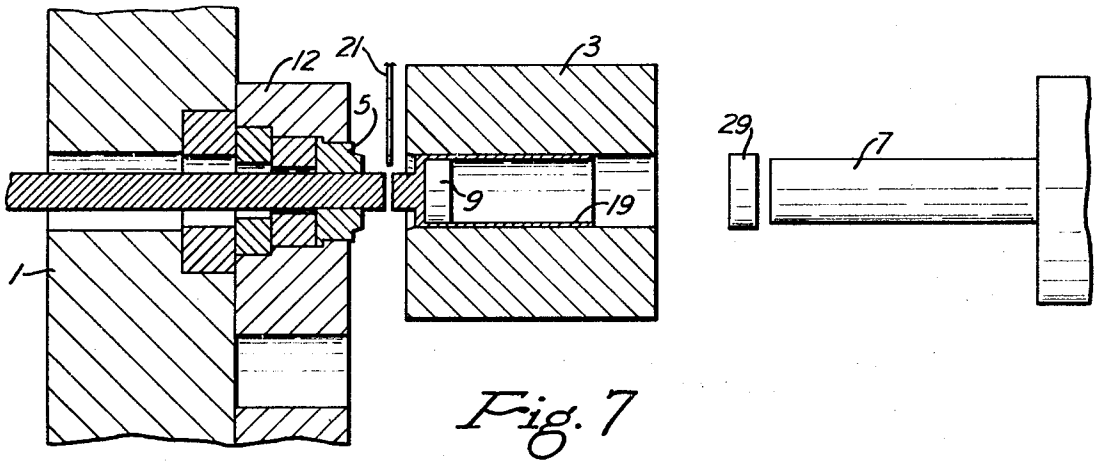



Fig. 7

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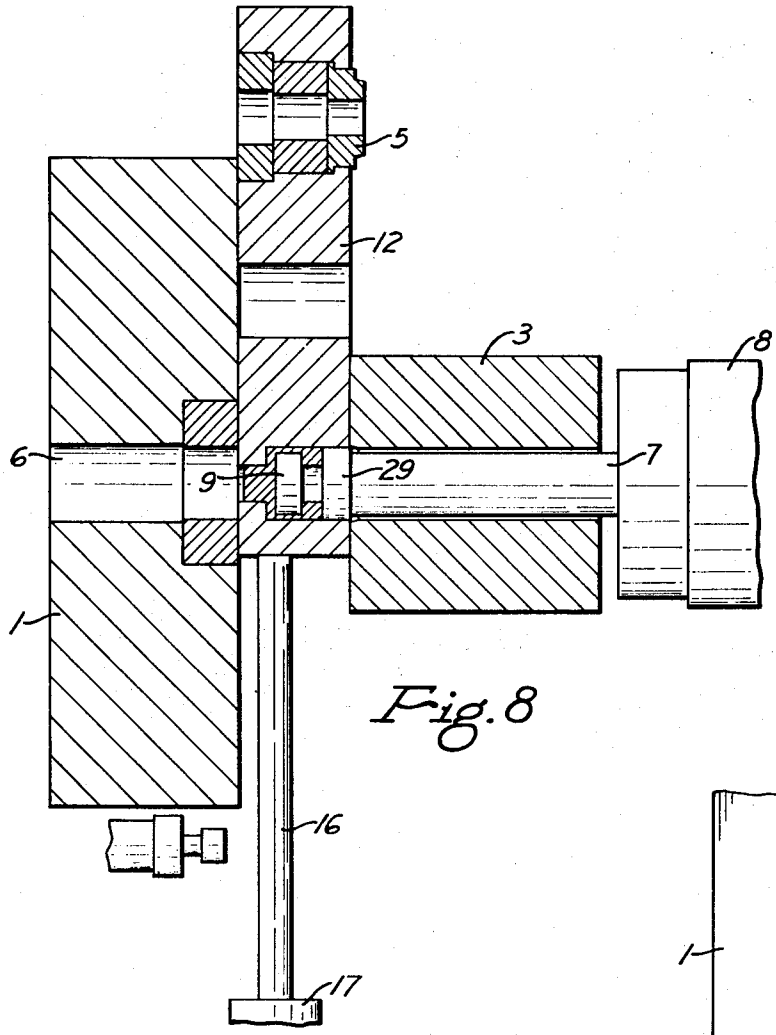



Fig. 8

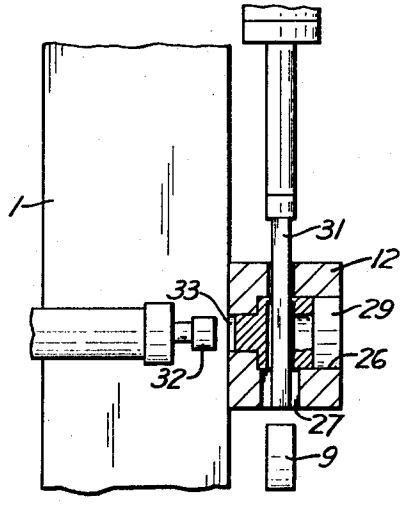



Fig. 9

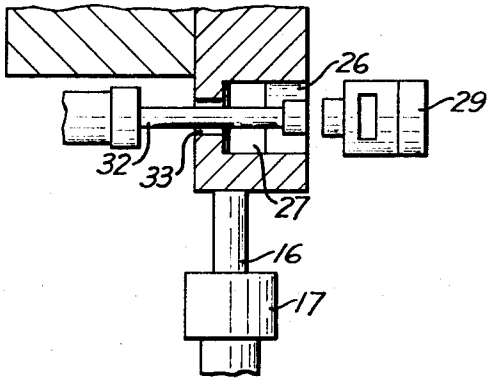



Fig. 10

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# EXTRUSION PRESS

In making metal extrusions it is common practice to place a dummy block between the ram and the billet that is being extruded. The diameter of the block is somewhat less than the diameter of the opening in the container for the billet so that during extrusion the billet forms a shell around the dummy block and ram as they are moved forward through the billet. After the extrusion has been cut off, the dummy block and the adjoining remains of the billet must be removed from the container. During this operation the portion of the shell extending rearwardly from the dummy block is compressed around the back of the block so that the latter becomes encased in the remnant. The practice heretofore has been to transfer this remnant to other apparatus for extracting the dummy block so that it can be used again. This requires extra time and labor.

It is among the objects of this invention to provide an extrusion press, in which no outside handling equipment is required for extracting the dummy block, and in which the press itself is provided with means for extracting the dummy block while another billet is being extruded in the same press.

The preferred embodiment of the invention is illustrated in the accompanying drawings, in which:

FIG. 1 is a fragmentary plan view of the front end of the extrusion press;

FIG. 2 is a vertical section taken on the line II—II of FIG. 1;

FIG. 3 is a view of the left-hand side of the press as viewed in FIG. 2;

FIG. 4 is an enlarged fragmentary vertical section taken on the line IV—IV of FIG. 2;

FIG. 5 is an enlarged fragmentary vertical section taken on the line V—V of FIG. 1;

FIGS. 6, 7 and 8 are simplified fragmentary horizontal sections showing successive stages in the operation of the press;

FIG. 9 is a simplified vertical section showing the dummy block being ejected; and

FIG. 10 is another horizontal section, showing the billet remnant being ejected from the slide.

Referring to FIGS. 1, 2, 3 and 5 of the drawings, the extrusion press has heavy front and rear upright platens, only the front platen 1 being shown. These platens are connected by four heavy tie rods 2 that take the thrust of the extruding operation. Spaced behind the front platen is a billet container 3, from which a billet 4 (FIG. 5) is forced forward through an extrusion die 5 located between the container and the platen. The latter is provided with a horizontal opening 6 through it, through which the extrusion passes. The billet is extruded by a ram 7 that is moved forward by conventional hydraulically operated means 8 located between the ends of the press. Between the ram and the billet there is a dummy block 9 of conventional form.

The extrusion die is removably mounted in a recess 11 in a slide 12 formed from a heavy block of metal disposed between the container and the platen. The slide is mounted between parallel upper and lower horizontal guides 13 and 14 that have ribs projecting into longitudinal slots 15 in the top and bottom of the slide. The slide can be moved lengthwise across the container by means of a piston rod 16 secured to the end of the slide remote from the die. The rod projects from a fluid pressure cylinder 17 supported by a bracket 18 from the adjoining side of the platen. With the slide in the full line position shown in FIG. 2, extrusion of a billet in the container is accomplished in the usual way by driving the ram and dummy block forward in the container. This forces the metal of the billet forward through the die and the opening in the platen to produce an extrusion as illustrated in FIG. 6, which can be either solid or tubular, depending on the ram structure. Since the diameters of the ram and block are somewhat less than the inside of the container, a skirt or shell 19 is formed around the block and extends back around the ram in a known manner.

The next operation, which also is conventional, is shown in FIG. 7. The ram is withdrawn from the container and the container is retracted to pull back the extrusion a short distance so that a few inches of it will be exposed between the container and the die. A saw 21 is then used to cut the extrusion at this point, leaving the dummy block and the remains of the billet in the container. The container is slidable along tracks 22 and is retracted by parallel piston rods 23 attached to it and extending through the front platen and into fluid pressure cylinders 24 secured to it.



It is a feature of the invention that the end of the slide opposite the die is provided with a rearwardly opening recess 26 extending most of the way through it, as shown in FIG. 4, and with a vertical passage 27 intersecting this recess. The vertical passage is wider below the recess than above it, the width below the recess being great enough to accommodate the dummy block. The recess is of such diameter as to be capable of receiving the remnant of the billet when the slide is moved to its right-hand position in FIG. 2 with the recess aligned with the container opening as shown in FIG. 8. The recess itself may be formed in a removable insert 28 fitting in a horizontal opening through the slide. After this recess has been located between platen opening 6 and the container, the latter is moved forward against the slide again and a clean-out block 29 (FIGS. 7 and 8) of the same diameter as the inside of the container is forced through the container by the ram. This pushes the billet residue forward into the slide recess until stopped by its front wall, and then causes the billet shell to be crimped and compressed forward against the back of the dummy block so that the block is encased in the shell inside the slide. The ram also forces the clean-out block into the recess in the slide.

The container then is retracted so that the slide can be returned to its original position, whereupon the container is moved forward against the slide again so that extrusion of a new billet may be commenced immediately. While a new extrusion is being made, a fluid pressure operated vertical ram 31, supported by bracket 18 directly over vertical slide passage 27, is run down to force the ram through the billet remnant in the slide in order to break the dummy block out of that remnant and eject the block from the bottom of the slide as shown in FIG. 9. The vertical ram then is raised and a fluid pressure operated horizontal ram 32, supported by bracket 18 in front of the slide recess 26, is operated to move the ram back through an opening 33 in the front wall of the recess to eject from the back of the slide the clean-out block and the remains of the billet as shown in FIG. 10.

The central portion of the slide may be provided with a horizontal passage 35 through it, through which a "sticker" can be ejected from the container if that should become necessary. The stuck billet would be forced through this opening in the slide and opening 6 through the platen.

With this apparatus it is unnecessary to remove the billet residue and the dummy block from the press in order to separate the block, because the separating step is performed in a part of the press itself and during an extrusion cycle. No outside handling equipment is required.

According to the provisions of the patent statutes, I have explained the principle of my invention and have illustrated and described what I now consider to represent its best embodiment. However, I desire to have it understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

I claim:

1. In an extrusion press, a container for a billet and dummy block, an extrusion die in front of the container, a slide carrying the die, means for pushing a dummy block forward in the container to extrude a billet through the die, means for retracting the container to permit the extrusion to be cut off between the container and die, the slide being provided with a rearwardly opening recess therethrough spaced laterally from said die and with a vertical passage intersecting the recess, a vertical ram above said vertical passage, means for moving the slide horizontally in one direction to position said recess in front of the container to receive the dummy block and remains of the billet from the container, means for returning the slide to its original position, means for moving the vertical ram down through said passage and recess to eject the dummy

block from the bottom of the slide, and means for ejecting the remains of a billet in said recess from the back of the slide.

2. In an extrusion press as recited in claim 1, said slide recess having a front wall provided with an opening therethrough, and said last-mentioned means being mounted in front of said opening and movable rearwardly therethrough into said recess to accomplish said ejecting of the billet remains.

3. In an extrusion press as recited in claim 1, an upright platen engaging the front of said slide and provided with an opening therethrough in front of the container for passage of an extrusion from the die, and means connected to the platen slidably supporting the slide.

4. In an extrusion press as recited in claim 3, means connected to said platen supporting said ram and said ejecting means for the billet remains.

5. In an extrusion press as recited in claim 2, a common support for said ram and slide-moving means and ejecting means for the billet remains, said support being rigidly mounted on said platen.

* * * * *

# UNITED STATES PATENT OFFICE
# CERTIFICATE OF CORRECTION

Patent No. 3,653,247 Dated April 4, 1972

Inventor(s) Helmut B. Huertgen

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

**The correct spelling of the inventor's last name is Huertgen.**

Signed and sealed this 11th day of July 1972.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents

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