May 8, 1945. L. H. MORIN 2,375,486

METHOD OF TRIMMING GATES OF DIE CASTINGS

Filed Jan. 15, 1943

Fig. 1.

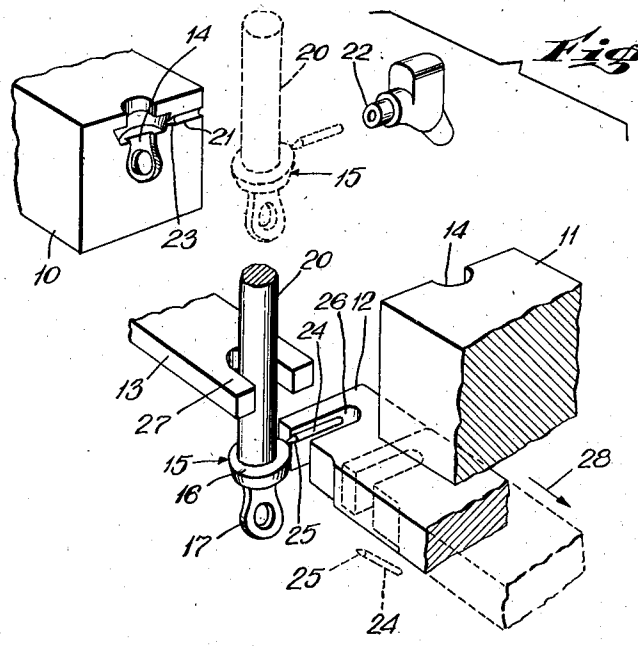


Fig. 3.

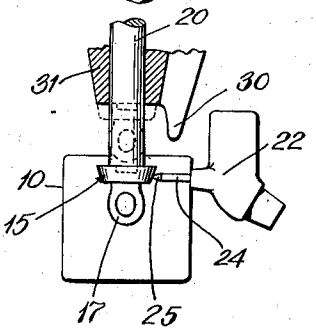


Fig. 2.

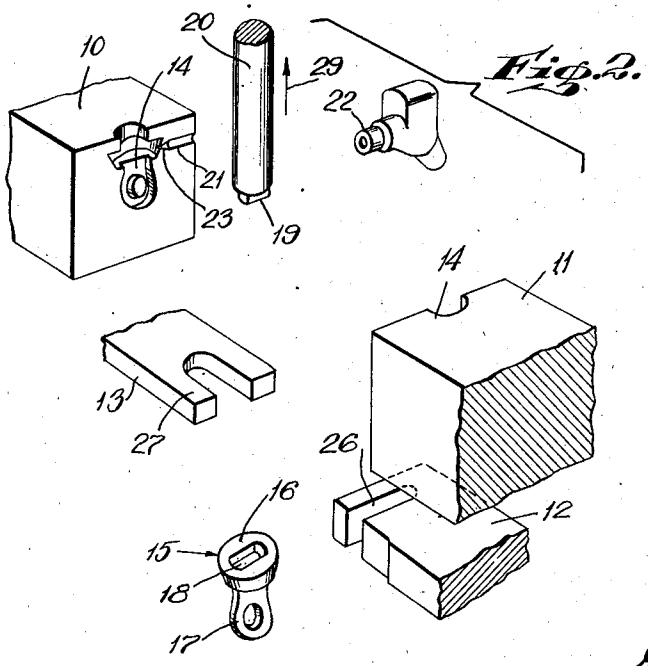
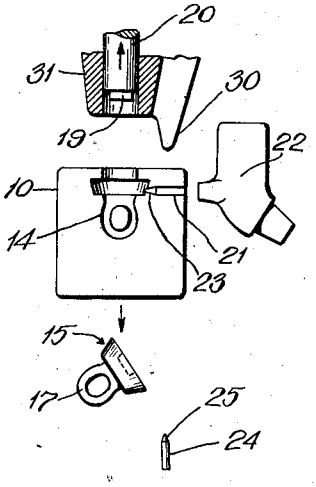


Fig. 4.



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METHOD OF TRIMMING GATES OF DIE CASTINGS

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Application January 15, 1943, Serial No. 472,492

1 Claim. (Cl. 22—200)

This invention relates to the formation of die castings including gate portions where the casting is formed on a core, the latter serving to eject the castings from the dies in the separation of said dies.

It is an object of this invention to provide an improved method of handling and finishing die castings.

In accordance with the invention, a casting, including a gate or sprue, is formed on a core. While the casting is still supported on the core, the gate or sprue is trimmed from the casting and then the latter is stripped from the core.

The invention will be defined in the claims and illustrated by the following description when taken together with the accompanying drawing, in which certain embodiments of apparatus adapted for practicing the method of the invention are disclosed, and in which the separate parts are designated by suitable reference characters in each of the views, and in which:

Fig. 1 is a diagrammatic exploded perspective view showing the dies in open position with the casting supported on a core, and illustrating the trimming and stripper tools.

Fig. 2 is a view similar to Fig. 1, showing parts in different positions.

Fig. 3 is a sectional detailed view along the parting line of relatively movable dies, illustrating another form of trimming and stripper elements, and

Fig. 4 is a view similar to Fig. 3, showing parts in a different position.

In the accompanying drawing, different forms of apparatus are diagrammatically shown adapted for the practice of the method of the invention.

Figs. 1 and 2 of the drawing show the various parts of the apparatus diagrammatically and also in what might be termed exaggerated relationship, particularly in that the two die parts 10 and 11 are shown in wide spaced relationship in order to clearly illustrate the gate trimming tool or member 12 and the stripper 13.

On abutting surfaces of the dies 10 and 11 are cavities or impressions 14 which collectively form what may be termed a button shank 15, comprising as noted in Fig. 2, a disc like body 16 with a depending ring or eye portion 17. The disc 16 has an aperture 18 in the upper surface thereof, formed by the reduced end 19 of a core pin 20.

Also formed on the abutting surfaces of the dies 10 and 11 are admission passages 21 through which casting material from an injection nozzle 22 is pressure fed into the cavity or impression 14 in forming the resulting casting 15, upon the lower end of the core 20. The passage 21, where it joins the cavity 14 is contracted, as seen at 23, to form on the resulting gate 24 a weakened end 25 which facilitates removal of the gate 24 and dispenses with the use of a sharp trimming tool. It will here be understood, however, that in some instances sharp trimming tools may be employed to actually shear the gate adjacent or at the periphery of the casting.

The trimming tool 12 in the construction shown, comprises a bar movable transversely with respect to movement of the core 20, and has at its inner end an aperture or pocket 26 to receive the gate 24 when the core 20 is lowered to the trimming position, as shown in full lines in Fig. 1. After the core has been moved into this position, the stripper tool 13 is moved in the direction of the core 20 so that the forked end of 27 thereof envelopes the core, as seen in Fig. 1.

The trimming tool 12 is now moved in the direction of the arrow 28 as indicated by the dotted lines in Fig. 1, which results in removing or trimming the gate 24 from the casting 15. Immediately upon completion of this operation, the core 20 is then moved upwardly in the direction of the arrow 29 of Fig. 2, which results in stripping the casting 15 therefrom by the stripper 13. The stripper is then moved into retracted position, the dies 10 and 11 again moved into closed position upon the core 20, the nozzle brought into engagement with the dies, and the next successive casting is formed.

After the casting is formed, the dies 10 and 11 are separated as indicated in Fig. 1, leaving the casting 15 supported on the core 20 as indicated in the dotted position of these parts in Fig. 1, the core 20 being used to eject the castings from the impressions 14. Thereafter, the above operation is again repeated to trim and eject the next successive casting.

Castings of this type and kind can be produced at high rates of speed, and will result in production of finished products, except where plating and other operations might be desirable.

It will be understood that the particular article or casting shown in the accompanying drawing is simply illustrative of one of many types and kinds of castings which can be produced in this manner. Where mass production is desired and excessive handling dispensed with for the purpose of minimizing, to the greatest degree, the cost of production, suitable means

will be provided in the die casting machine for delivering the finished trimmed articles to containers. These containers may be in the form of shipping cases or cartons, automatically moved into receiving position by controlled counters, which will count the number of castings formed and delivered to each container. In other instances, the castings may be collected in bulk and simply weighed out for packaging and distribution.

In Figs. 3 and 4 of the drawing is shown a slight modification which consists primarily in, substituting for the trimming tool 12 and stripper 13, a combined trimming tool 30 and stripper 31, arranged upon the core 20 above the dies 10—11, instead of beneath the dies, as shown in Figs. 1 and 2.

With this construction and method of operation, the core 20 moves upwardly when the dies 10—11 are separated, instead of moving downwardly as in Figs. 1 and 2. The trimming and stripping tools 30, 31 are held stationary, and as the tool 30 projects below the lower surface of the stripper 31, this tool will first engage the gate 24 of the casting 15 to remove or trim it from the casting, after which the continued upward movement of the core will result in stripping the casting 15 from the core, as is illustrated in Fig. 4 of the drawing.

In some types and kinds of casting, the method of procedure as illustrated in Figs. 3 and 4, would be desirable over the method illustrated in Figs. 1 and 2, particularly in that less moving parts are employed and further where a trimming operation of this kind is sufficient to produce the desired results. In other instances, the trimming operation such as shown in Figs. 1 and 2 will be desirable and some times necessary.

It will also be apparent from a consideration of Figs. 3 and 4 of the drawing that where the dies are separated sufficiently, the core 20 may be held stationary and the tools 30, 31 moved downwardly in performing their combined trimming and stripping operations.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent is:

The method of trimming gate portions from die castings, which comprises first forming a die casting between relatively movable dies and on a core arranged on the parting line of the dies, by injecting casting material through a gate passage on the parting line of the dies into the mold cavity of said die and around said core, then separating the dies, leaving the casting including a gate portion supported on said core, then moving the core with the casting thereon to a trimming position, holding said casting stationary so that it may not rotate about the longitudinal axis of said core, then moving a trimming tool transversely with respect to the direction of movement of the core to trim the gate from the casting while supported on the core, and then moving the core and casting in the opposite direction and relatively to a stripper tool arranged between and in spaced relation to the trimming tool and dies in stripping the trimmed casting from said core.

LOUIS H. MORIN.