Oct. 20, 1942. W. C. TOLAND 2,299,191

CASTING RULE HOLDING UNIT FOR STAMPING FORMS

Filed Nov. 22, 1940 3 Sheets-Sheet 1

Fig. 1.

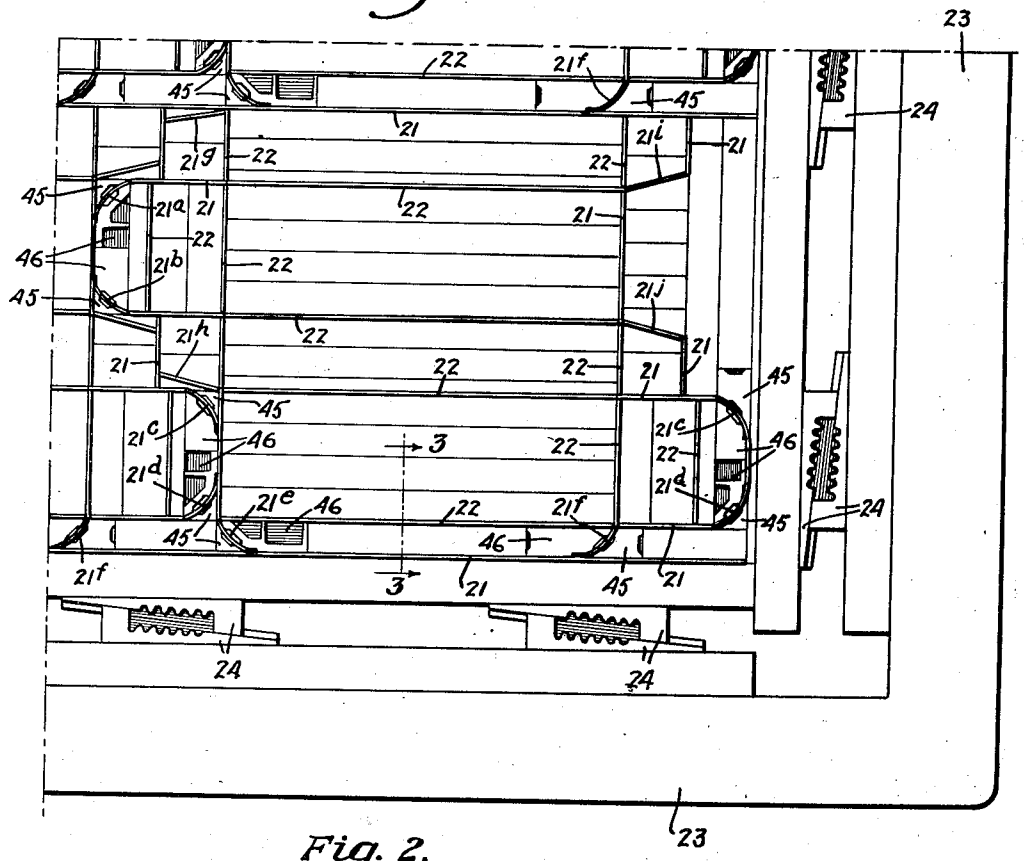


Fig. 2.

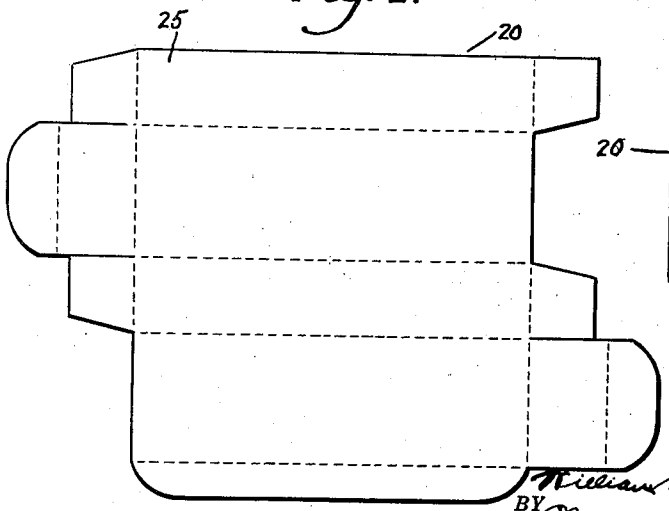


Fig. 3.

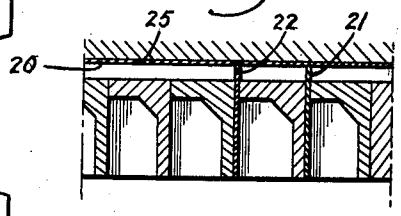
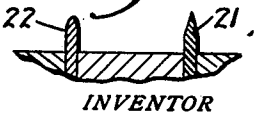


Fig. 4.



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Oct. 20, 1942. W. C. TOLAND 2,299,191

CASTING RULE HOLDING UNIT FOR STAMPING FORMS

Filed Nov. 22, 1940 3 Sheets-Sheet 2

Fig. 5.

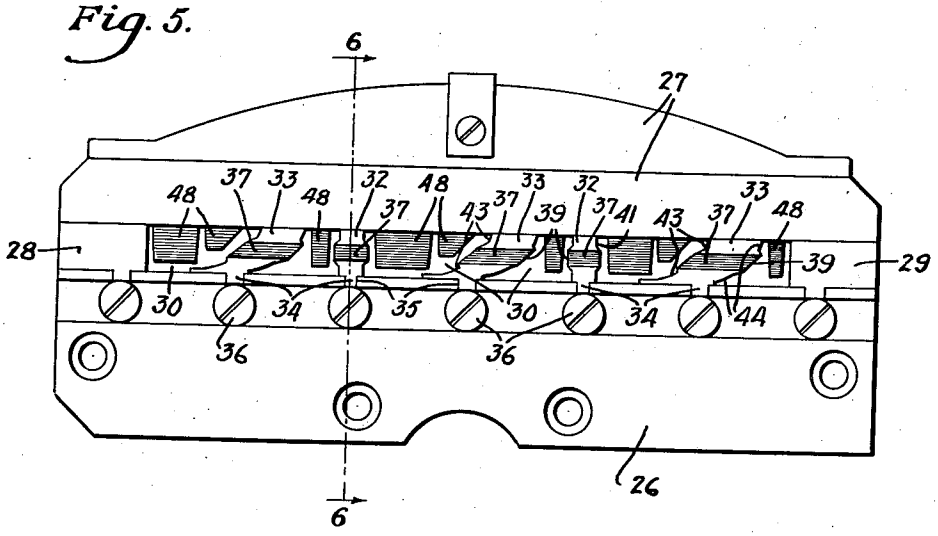


Fig. 6.

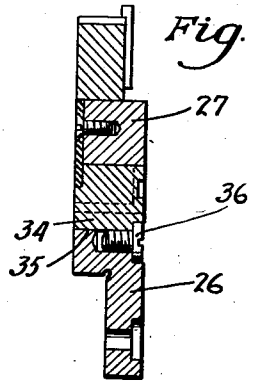


Fig. 8.

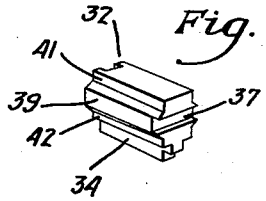


Fig. 9.

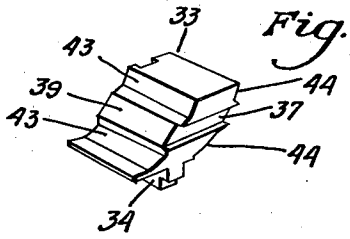
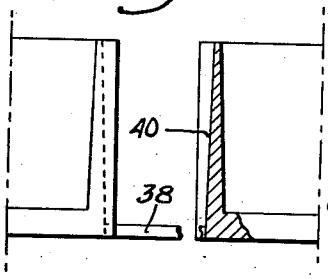


Fig. 7.



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Oct. 20, 1942. W. C. TOLAND 2,299,191

CASTING RULE HOLDING UNIT FOR STAMPING FORMS

Filed Nov. 22, 1940 3 Sheets-Sheet 3

Fig. 10.

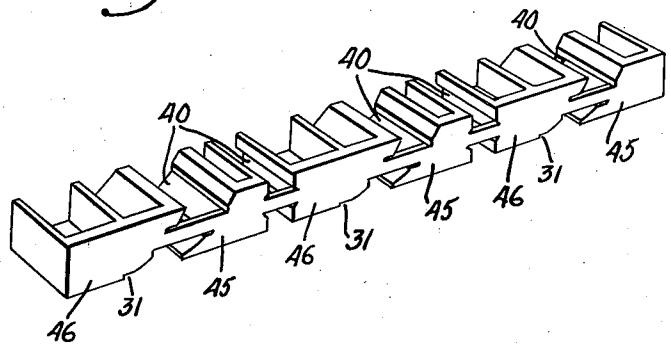


Fig. 11.

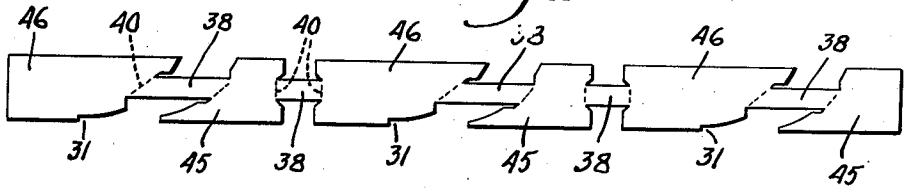
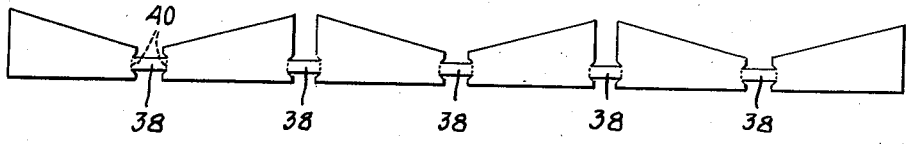


Fig. 12.



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UNITED STATES PATENT OFFICE

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CASTING RULE HOLDING UNIT FOR STAMPING FORMS

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Application November 22, 1940, Serial No. 366,543

16 Claims. (Cl. 199—55)

This invention relates to slug casting machines of the general organization represented in U. S. Letters Patent to O. Mergenthaler No. 436,532 wherein a melting pot is arranged to deliver molten metal into a slotted mold to produce a type bar or slug. More specifically, it relates to means which enables slugs to be cast in machines of this type which thereafter may be used as furniture to support the rules in a stamping form, as, for example, the rules employed to cut and score blanks capable of being folded to form cartons and the like.

When making up such forms the rules are usually supported in the desired position by means of furniture which heretofore has been sawed from wood or metal. While this arrangement for supporting the rules is satisfactory it is, nevertheless, open to the criticism that considerable expense is involved in sawing out and hand finishing the furniture to bring it to the exact shape required to support the rules in the various positions they must be held during the stamping operation.

In accordance with the present invention, however, such furniture is economically produced by casting the same in machines of the type mentioned above. In such machines, the mold cavity in which the slug is cast is usually defined by four distinct parts, namely, a cap portion, a body portion and two end liners. These liners are of various thickness and are selectively employed to vary the dimension of the mold slot or cavity according to the size of the slug to be cast. When furniture for supporting rules disposed parallel to the sides of the form is desired it may be cast in such molds in the usual manner in the form of blank slugs of standard sizes, and if necessary the slugs thus cast may thereafter be sawed to desired sizes. The sawing thus required, however, will be along lines at right angles to one of the edges of the slug in which case it may be done economically in the manner well understood in the art. However, when it is desired to cast furniture for supporting rules in say curved or angular positions the mold is provided with a casting face which is so shaped that when a slug is cast it will have a supporting face adapted to hold the rule in the desired form or position. The casting face for thus shaping the slug may be presented in a number of ways. For example, it may be presented by shaping one of the end liners (preferably the left hand end liner) or it may be presented by one or more core members positioned in the mold slot. To a large degree, the manner in which the casting face is presented depends on the configuration of the rules to be supported. For example, if a curved or an angularly disposed portion of a rule is followed by a relatively long stretch of straight rule it might be advantageous to shape the end liner so that a blank slug of standard length having a curved or a tapered end will be cast. On the other hand, if a curved or an angularly disposed portion of a rule joins with another curved or angularly disposed portion or with a relatively short stretch of straight rule it might be advantageous to employ one or more core sections in the mold slot and to so shape the casting faces thereof that when a slug is cast it will comprise two or more units having faces adapted to support the rules in the desired form or position.

For a more detailed description of the invention reference may be made to the accompanying drawings. In these drawings, however, the invention has been shown merely by way of example and in preferred form, and obviously many variations and modifications may be made therein which will still be comprised within its spirit. It is to be understood, therefore, that the invention is not limited to any specific form or embodiment, except insofar as such limitations are specified in the appended claims.

Referring to the drawings—

Figure 1 is a plan view of a portion of a form made up to stamp out a plurality of carton making blanks.

Figure 2 is a plan view of a blank cut and creased by the form shown in Figure 1.

Figure 3 is a sectional view taken along the line 3—3 of Figure 1.

Figure 4 is an enlarged view showing the cutting and creasing rules employed in the form.

Figure 5 is a front view of a mold modified in accordance with the present invention.

Figure 6 is a sectional view taken along the line 6—6 of Figure 5.

Figure 7 is a plan view showing the manner in which the slug units may be broken apart.

Figure 8 is a perspective view of a slug unit forming core member.

Figure 9 is a perspective view of a slug unit separating core member.

Figure 10 is a perspective view of a slug cast in a mold modified in accordance with the present invention.

Figure 11 is a front view of the slug shown in Figure 10; and

Figure 12 is a front view of a slug cast in another mold modified in accordance with the present invention.

As usual when assembling a form (see Figure 1) to stamp out blanks **20** of the sort shown in Figure 2, cutting and creasing rules **21**, **22** are supported in desired position by furniture in a chase **23** and the assembly thus formed is locked by means of quoins **24**.

The cutting rules **21** (see Figure 3) are adapted and arranged to cut through the material **25** from which the blanks are to be made in the manner shown by full lines in Figure 2 while the creasing rules **22** are adapted and arranged to simply score or crease the blanks in the manner shown by the dotted lines in Figure 2.

As stated heretofore, the purpose of the present invention is to enable the furniture used to support the cutting and creasing rules to be cast as slugs in machines of the type beforementioned wherein the molds usually employed comprise a body portion **26**, a cap portion **27**, and a pair of end liners **28**, **29** which define a mold slot or cavity **30** in which the slug is cast. Also, as stated heretofore, the end liners **28**, **29** are of various thicknesses and they are selectively employed to vary the dimensions of the mold slot or cavity **30** according to the size of the slug to be cast.

By referring to Figure 1, it is seen that six curved cutting rules **21***a* to **21***f* and four angularly disposed cutting rules **21***g* to **21***j* are required to stamp out each blank. The remainder of the rules, both cutting and creasing, are positioned parallel with or at right angles to one another and to the sides of the form. In consequence, the major portion of the furniture needed to support the rules may be cast as blank slugs in the usual manner in the molds of such machines. These slugs may be cast in standard sizes, preferably in multiples of the space they are to occupy. If necessary, however, the slugs so cast may be sawed to the exact size required to fill in a given space, but, as stated heretofore, the sawing thus required will be along lines parallel to one face of the slug in which case it may be accomplished inexpensively. As usual, when the slugs thus cast are of the larger sizes, the cap portion of the mold is provided with depending core members so that the slugs will be of the so-called skeleton type.

The remaining portion of the furniture needed to support the rules may also be cast in the form of blank slugs in such molds, but since these slugs must present curved and angularly disposed supporting faces to accord with the curved and angularly disposed rules, the molds must be modified accordingly.

In the form shown in Figure 1, the rules are so curved that the duplicate of a slug shaped to support the inner or the outer face of one rule may be used to support the inner or the outer face of another rule by placing the slug face up or face down as may be necessary. In the form shown, however, it is to be noted that the adjacent ends of curved rules **21***a*, **21***b* and the adjacent ends of curved rules **21***c*, **21***d* are separated by a short stretch of a straight rule while the adjacent ends of the remaining two curved rules **21***e*, **21***f* employed to stamp out a blank are separated by a much longer stretch of straight rule. Furthermore, it is to be noted that since the straight rules between the ends of the curved rules are utilized to cut the ends of adjacent blanks, a shoulder **31** is formed where the ends of the curved rules join this straight cutting rule so employed. Under these conditions it is deemed advisable that the mold be modified to cast slug units shaped to support the outer side faces of the curved rules and slug units shaped to support the inner side faces of the curved rules and one half the short stretch of straight rule which separates adjacent ends of the curved rules. To these ends, a plurality of slug unit forming core members **32** (see Figure 8) and a plurality of slug unit separating core members **33** (see Figure 9) are positioned in the mold slot or cavity (see Figure 5). Each core member is provided with a fore-and-aft tongue **34** which is positioned in a fore-and-aft groove **35** formed in the body portion **26** of the mold to hold them against lateral displacement during the casting and ejecting operations. In addition, the core members are held against forward displacement during the casting and ejecting operations by the heads of studs **36** threaded into the body portion **26** of the mold. The front face of each core member is provided with a transverse groove **37** in which is cast a bar **38** to connect the slug units together, this being desirable so that the slug units after being ejected from the mold may be stacked in a galley in the usual manner. The bar **38** thus formed, however, is fragile so that the units may be easily broken apart. In addition, the casting faces of the core members are formed with fore-and-aft ribs **39** which form fore-and-aft recesses **40** in the faces of the slug units where the bar **38** connects them so that the slug units may be broken apart without leaving ragged edges projecting beyond the supporting faces of the slug units.

The casting faces **41**, **42** of the slug unit separating core members **32** save for the ribs **39** are squared with respect to the casting face of the body portion of the mold, so that when the slug units are broken apart one end of the slug units may be squared up with regular slugs in the form.

One of the casting faces **43** of the slug unit forming core members **33**, save for the rib **39**, is shaped to accord with the outer side face of the curved rules and the other casting face **44** save for the rib **39** is shaped to accord with the inner side of the curved rules, with the shoulder formed where the curved rules meet the straight rules and with one half the inner side face of the short stretch of straight rules positioned between adjacent ends of the curved rules.

Under these conditions slugs of standard lengths may be cast comprising a number of units **45** having a face adapted to support the outer side of the curved rules and a number of units **46** having a face adapted to support the inner side face of the curved rule and one half the length of the inner face of the adjacent short stretch of straight rule. When these slugs are broken apart one unit **45** may be used to support the outer face of a curved rule and another unit **46** used to support the inner face of the curved rules and one half the length of the short stretch of the straight rule which extends between adjacent ends of the curved rules. In like manner duplicates of these slug units **45** may be used to support the outer faces of the remainder of the curved rules by placing them face up or face down as may be required and duplicates of slug units **46** may be used to support the inner faces of the remainder of the curved rules by placing them face up or face down as may be required. In the two cases where the ends of the curved rules are separated by a short stretch of straight rule two slug units **46** are all that is required. In the remaining case, a length of a standard slug will have to be interposed between the ends

of the slug units. In certain cases, it may be necessary to saw the slug units **45** cast to support the outer side faces of the curved rules to make them fit into the form but such sawing will be at right angles to one of the faces in which case it may be done economically. In the event the slug units thus required to support the curved rules are of the larger sizes, as they are in the form shown, the cap portion of the mold may be provided with depending core members **48** so that the slug units will be of the skeleton type.

In the form shown in Figure 1, it is also to be noted that the angularly disposed cutting rules **21***g* and **21***j* are all disposed at the same angle with respect to the sides of the form. In modifying a standard mold so that the slug units may be cast therein which are capable of being used to support these rules in the desired position, the slug unit forming core members **33** instead of being provided with curved casting faces are provided with casting faces shaped to produce slug units shown in Figure 12 where the upper faces thereof taper in accordance with the angle at which the rules are to be supported. In using these slug units one is positioned on one side and another postioned on the other side of the rule. When necessary these slug units may be sawed along straight lines to bring them to the desired dimensions to fit into the form.

It will be understood that when casting such blank slugs, the front and rear faces of the mold cavities defined by the core members **32, 33** are closed, their front faces being closed by the left-hand jaw or by a blank filling piece and their rear faces being closed by the mouthpiece of a metal pot from which molten metal is forced by the action of a pump through a plurality of small orifices in the mouthpiece into the mold cavities and up against the front closure to form the connected slug units.

It will be also understood that when ejecting such slugs, the ejector mechanism usually employed in such machines must be so modified as to prevent the core members **32, 33** from being disturbed during the ejecting operation.

Having thus described my invention what I claim is:

1. In or for a slug casting machine, a slug casting mold, and a core member positioned in said mold to divide the same into separate casting cavities, said core member having casting faces which are shaped to accord with the opposite side faces of a rule located in a stamping form in a position other than parallel with one side of the form.

2. In or for a slug casting machine, a slug casting mold, and a core member positioned in the mold to divide it into separate casting cavities, said core member having casting faces which are shaped to accord with the opposite side faces of a curved rule positioned in a stamping form.

3. The arrangement set forth in claim 1 characterized in that the core member is provided with a face groove which establishes communication between the cavities.

4. In or for a slug casting machine, a slug casting mold comprising a body portion, a cap portion and end liners which define a mold cavity, core members located in said cavity to divide the same into a number of cavities, one of said core members having a pair of casting faces which are shaped to accord with the opposite side faces of a rule located in a stamping form in a position other than parallel with one side of the form, and another of said core members having a pair of complementary casting faces.

5. The arrangement set forth in claim 4 characterized in that said core members are provided with face grooves which establish communication between said cavities.

6. The arrangement set forth in claim 4 characterized in that the front faces of the core members are provided with grooves which establish communication between the cavities and in that the side faces of the core members are provided with ribs which extend rearwardly from the face grooves.

7. In or for a slug casting machine, a slug casting mold comprising a cap portion, a body portion and end liners which define a mold cavity, and a core member supported within the cavity, said core member having a pair of casting faces which taper with respect to the casting face of of the body portion of the mold.

8. In or for a slug casting machine a slug casting mold comprising a cap portion, a body portion and end liners which define a mold cavity, and a core member supported within the cavity, said core member having a pair of curved casting faces.

9. In or for a slug casting machine, a slug casting mold adapted to produce a slug having a face which extends in other than a continuous straight line with respect to its base.

10. In or for a slug casting machine, a slug casting mold adapted to produce a slug having a curved face.

11. In or for a slug casting machine, a slug casting mold comprising a cap portion, a body portion and end liners which define a mold cavity, and a core member secured in said cavity to divide the same into separate cavities, said core member having a casting face which tapers with respect to the casting face of the body portion of the mold.

12. In or for a slug casting machine, a slug casting mold comprising a cap portion, a body portion and end liners which define a mold cavity, and a core member secured in said cavity to divide the same into separate cavities, said core member having a curved casting face.

13. In or for a slug casting machine, a slug casting mold comprising a cap portion, a body portion and end liners which define a mold cavity, and a core member secured in said cavity to divide the same into separate cavities, said core member having a casting face shaped to accord with one of the side faces of a rule to be supported in a stamping frame.

14. A casting metal slug comprising a plurality of spaced apart rule supporting units connected together by fragile metal linkage.

15. A cast metal slug comprising spaced apart complementary rule supporting units formed to accord with the shape of opposite side faces of a rule and connected together by fragile metal linkage.

16. A cast metal slug comprising a plurality of pairs of spaced apart complementary rule supporting units connected together by fragile metal linkage, the units of each pair being formed to accord with the shape of opposite side faces of a rule.

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