

Nov. 22, 1938.

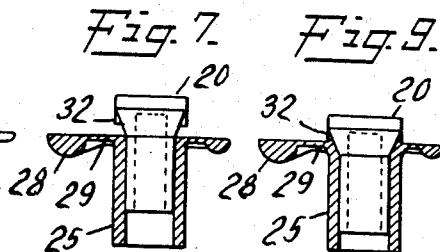
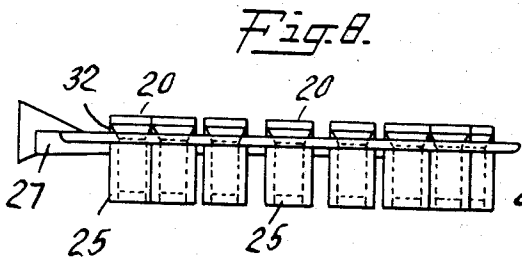
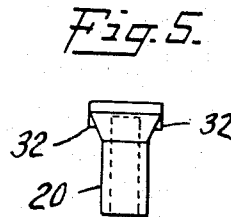
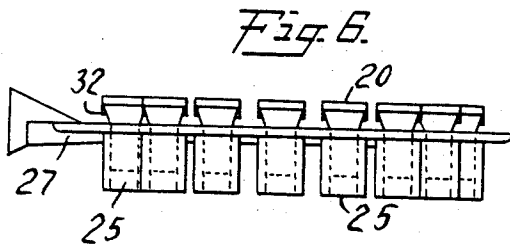
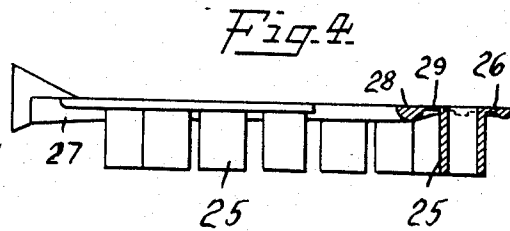
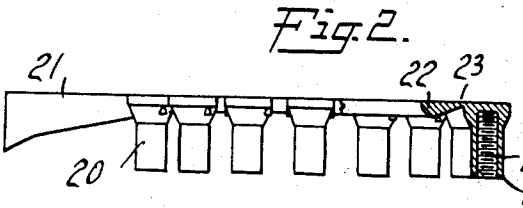
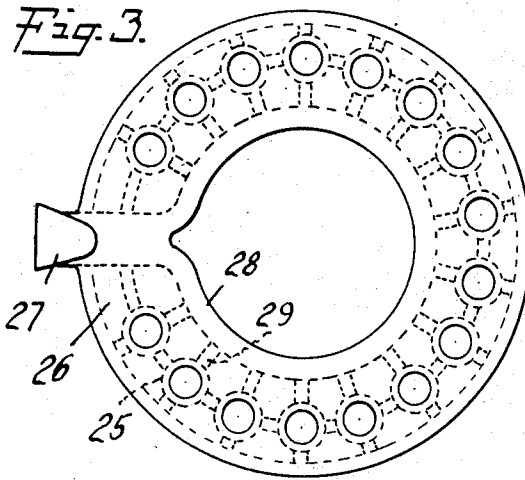
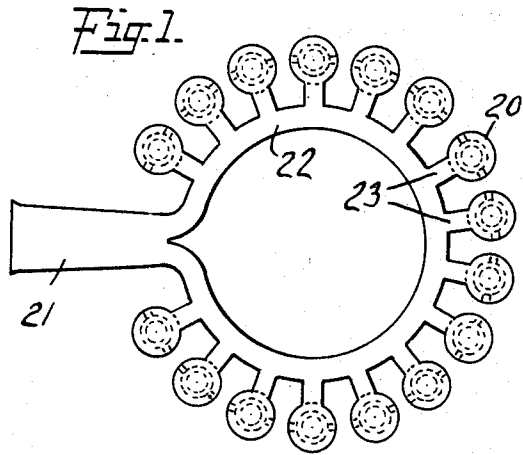
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2,137,537

PROCESS OF DIE CASTING AND ASSEMBLING EXPANSION SHIELDS OR ANCHORS

Filed Jan. 7, 1937

2 Sheets-Sheet 1



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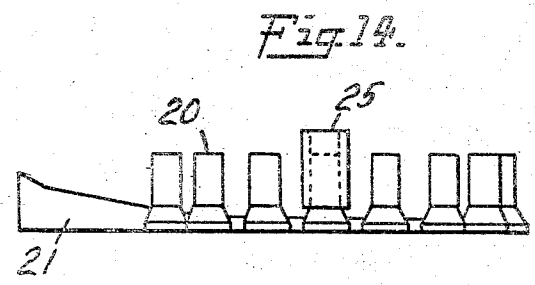
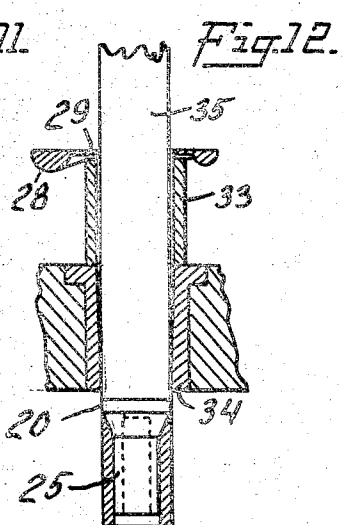
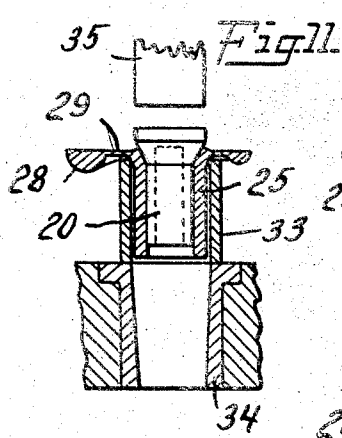
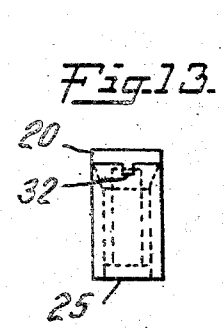
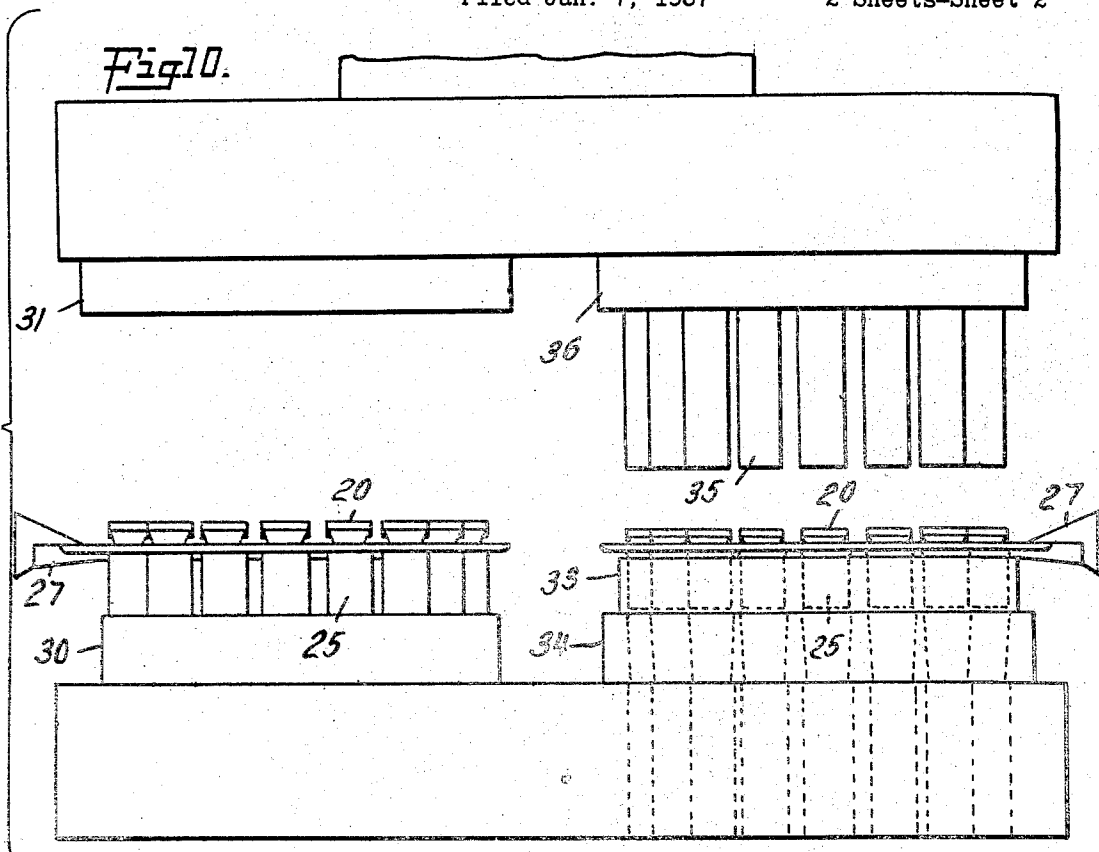
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PROCESS OF DIE CASTING AND ASSEMBLING EXPANSION SHIELDS OR ANCHORS

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2 Sheets-Sheet 2



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2,137,537

PROCESS OF DIE CASTING AND ASSEMBLING EXPANSION SHIELDS OR ANCHORS

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a corporation of Illinois

Application January 7, 1937, Serial No. 119,465

5 Claims. (Cl. 29—148)

This invention relates to a process of die casting and assembling expansion shields or anchors.

One type of anchor, such as that illustrated in Patent No. 1,695,303, granted December 18, 1928, comprises an outer element or sleeve of soft or ductile metal and an inner expanding element of harder metal having tapered or wedge portions arranged to be forced or drawn into the sleeve, whereby the sleeve is expanded laterally into engagement with the wall of the opening in which the anchor is positioned.

The sleeve and expanding element are now cast separately in poured molds and are then assembled.

This invention has for its salient object to simplify the making and assembling of anchor units of the character described thereby cutting down on the number of operations now required for the manufacture of such anchors.

Another object of the invention is to provide a simple, practical and efficient process or method of economically manufacturing anchors of the type described.

Further objects of the invention will appear from the following specification taken in connection with the drawings which form a part of this application, and in which

Fig. 1 is a top plan view of a group of die cast expanding units for a bolt anchor, these elements being connected by the sprue;

Fig. 2 is a side elevation of the structure shown in Fig. 1, one of the expanding elements and the adjacent portions of the sprue being shown in section;

Fig. 3 is a top plan view similar to Fig. 1 but showing a group of expansible units or soft metal sleeves connected together by the sprue in the die casting;

Fig. 4 is a view similar to Fig. 2 and is a side elevation of the structure shown in Fig. 3, one of the units and the adjacent portions of the sprue being shown in section;

Fig. 5 is an enlarged elevational view of one of the expanding elements after it has been separated from the group or die casting;

Fig. 6 is a view showing the die casting of the group of expansible anchor units or sleeves in which the separated expanding elements or units have been assembled;

Fig. 7 is an enlarged sectional elevation illustrating one of the sleeves and the adjacent portions of the sprue and the expanding element assembled therein;

Fig. 8 is a view similar to Fig. 6 but showing the parts in the position taken after the expanding elements have been forced into the sleeves;

Fig. 9 is a sectional elevation similar to Fig. 7 but showing the parts in the position taken in Fig. 8;

Fig. 10 is an elevational view somewhat dia-

grammatic showing the method by which the expanding elements are forced from the position shown in Fig. 6 to the position shown in Fig. 8 in the expansible elements or die cast sleeves, and also showing the manner in which the two elements of the anchor are finally assembled and are detached from the sprue;

Fig. 11 is an enlarged sectional elevation illustrating the manner in which the anchors are forced into the trimming and forming dies, this view illustrating the parts prior to the operation of the trimming and forming plungers or punches;

Fig. 12 is a view similar to Fig. 11 but showing the plunger or punch at its extreme lower position in which it has ejected the completed anchor from the forming die;

Fig. 13 is an elevational view showing the completed anchor; and

Fig. 14 is a view similar to Fig. 6 but showing the soft metal sleeves detached from the die casting and assembled on the expanding elements which are still retained in connected relation in the die casting.

The process briefly described consists of die casting in a group the soft metal expansible elements and die casting in a group the expanding elements of harder metal, separating the elements of one group from the sprues and from each other, assembling those elements with relation to the other set of elements still retained in group formation, properly aligning the elements still connected together in a die casting, and then forcing the assembled elements through a trimming die and forming die, thus detaching the assembled or grouped elements from the connecting portions of the sprue and forcing the inner or expanding element of the anchor into the outer or expansible element of the anchor.

Further details of the invention will appear from the following description.

The process described and claimed in this application is similar in certain respects to that described and claimed in applicant's copending application 119,466, filed January 7, 1937, but is patently distinct therefrom.

In the particular embodiment of the invention illustrated in the drawings, the expanding elements 20 are cast in one die casting shown particularly in Figs. 1 and 2. These are die cast in a die having a gate through which the molten metal is forced into the die, the gate being connected to a circular groove which in turn is connected by lateral or radial grooves to the mold cavities in which the elements 20 are cast. In Fig. 1 the casting comprises a sprue 21 having a circular portion 22 and lateral or radial portions 23 which are connected to the separate elements or units 20. As shown in Fig. 2, each unit has cast therein an internal thread 24.

In Figs. 3 and 4 there is shown a die casting of 60

the outer or expansible anchor elements or sleeves 25. In the casting the sleeves are connected by an annular portion 26 of excess metal. The die comprises a sprue 27 which has formed thereon an annular portion 28 connected by lateral or radial portions 29 to the sleeves 25.

After the inner and outer expansion shield or anchor elements are cast in the manner shown in Figs. 1 and 3 and above described, one group of these elements, such as the expanding elements 20, is separated by breaking off the laterally extending portions 23 of the sprue and the separated elements are assembled in the sleeves on the other die casting, as shown in Fig. 6.

After the parts have been assembled in the manner just described, the die casting of the sleeves with the expanding elements assembled therein is placed on a support 30 shown in Fig. 10 and a plunger or die 31 having a flat or plane undersurface is depressed, thus engaging the upper ends of the expanding elements 20 and forcing them downwardly to a position in which laterally projecting lugs 32 formed on the elements 20 seat on the upper surface of the die casting of the sleeves. This is the position shown at the right in Fig. 10.

The pressure exerted by the plunger 31 not only forces the elements 20 into the sleeves 25, but properly aligns the sleeves. This alignment could also be accomplished between plunger 31 and support 30 before the elements 20 are inserted in the sleeves.

After the expanding elements 20 have been assembled in the manner shown in Figs. 8 and 9, the die casting and assembled units are placed in a trimming die 33 which is positioned above a forming die 34. The assembled parts are forced into and through the trimming die and forming die by means of plungers or punches 35 which are carried by a die or plunger 36 disposed above the trimming and forming dies.

The punches or plungers 35 engage the upper ends of the expanding elements 20 and force the expanding elements and sleeves downwardly into the trimming die 33, thus breaking off the radial or lateral portions 29 of the sprue and separating the sleeves 25 from their connecting portions and from the excess casting metal. Furthermore, the elements 20 are forced downwardly into the sleeves 25 to the position shown in Figs. 12 and 13.

Instead of separating the expanding elements 20 and assembling them in the die casting of the sleeves 25, the sleeves may be separated or broken off from the die casting and assembled on the expanding elements 20, as shown in Fig. 14.

From the foregoing description it will be clear that a simple, practical and efficient process of making and assembling expansion anchor elements has been worked out and that this process will eliminate many operations now necessary in the manufacture and assembling of these elements.

Although one specific embodiment of the invention has been particularly shown and described it will be understood that the invention is not limited to the particular steps or sequence of steps outlined, but that the process may be modified and no limitations are intended other

than those set forth in the appended claims.

What I claim is:

1. The process of making and assembling inner expanding elements of relatively hard metal and outer expansible sleeves of relatively soft metal, said inner and outer elements forming expansion shields or anchors, which consists of casting said elements in a group bonded together by the casting sprue, casting said sleeves in a group bonded together by the casting sprue, separating the units of one group, assembling the separated units with the units of the connected group, forcing the inner expanding elements into the outer expansible sleeves and separating the grouped units during this last operation.

2. The process of making and assembling inner expanding elements of relatively hard metal and outer expansible sleeves of relatively soft metal, said inner and outer elements forming expansion shields or anchors, which consists of casting said elements in a group bonded together by the casting sprue, casting said sleeves in a group bonded together by the casting sprue, separating the units of one group, properly aligning the units of the other group, assembling the separated units with the units of the connected group, forcing the inner expanding elements into the outer expansible sleeves, and forcing the assembled units into a trimming die, thus separating the grouped units from the casting sprue and excess metal.

3. The process of making and assembling inner expanding elements of relatively hard metal and outer expansible sleeves of relatively soft metal, said inner and outer elements forming expansion shields or anchors, which consists of casting said elements in a group bonded together by the casting sprue, casting said sleeves in a group bonded together by the casting sprue, separating the hard metal elements, assembling the separated elements in the sleeves, forcing the inner expanding elements into the outer expansible sleeves and separating the grouped sleeves during this last operation.

4. The process of making and assembling inner expanding elements of relatively hard metal and outer expansible sleeves of relatively soft metal, said inner and outer elements forming expansion shields or anchors, which consists of casting said elements in a group bonded together by the casting sprue, casting said sleeves in a group bonded together by the casting sprue, separating the units of one group, properly aligning the units of the other group by pressing the die casting between parallel plane surfaces, assembling the separated units with the units of the connected group, forcing the inner expanding elements into the outer expansible sleeves and separating the grouped units during this last operation.

5. The process of making and assembling inner expanding elements and outer expansible elements for anchors, which consists of die casting a plurality of expanding elements in an interconnected group, die casting a plurality of expansible elements in an interconnected group, assembling the expanding elements in the expansible elements and aligning or straightening the elements and forcing the expanding elements into the expansible elements.

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