

Aug. 18, 1936.

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2,051,653

APPARATUS FOR CASTING INTERLOCKING RINGS

Filed Dec. 2, 1935

2 Sheets-Sheet 1

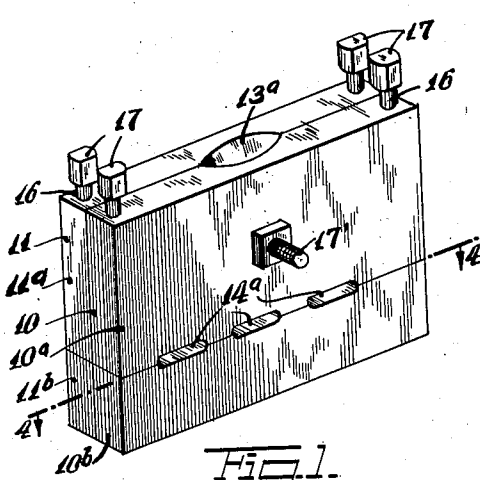


Fig. 1.

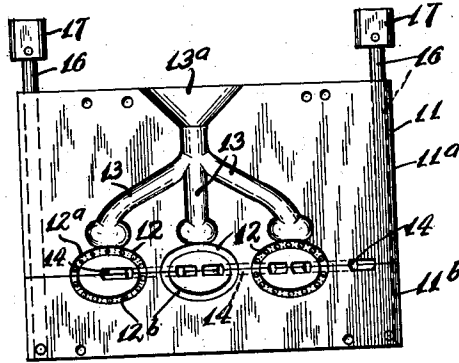


Fig. 2.

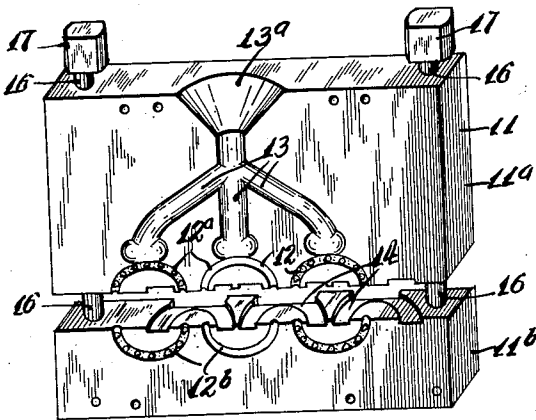


Fig. 3.

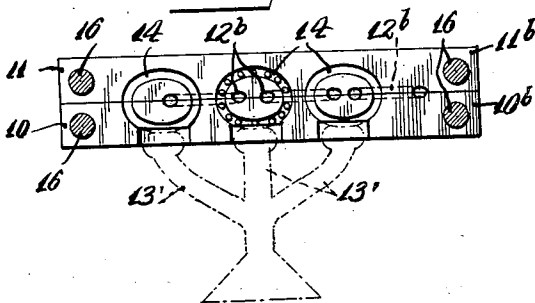


Fig. 4.

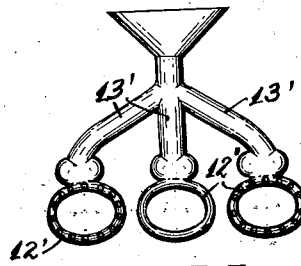


Fig. 5.

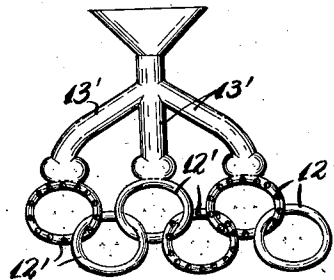


Fig. 6.

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2 Sheets-Sheet 2

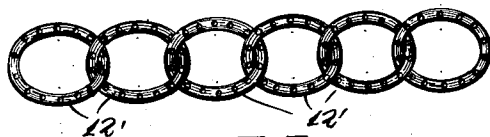


Fig. 7

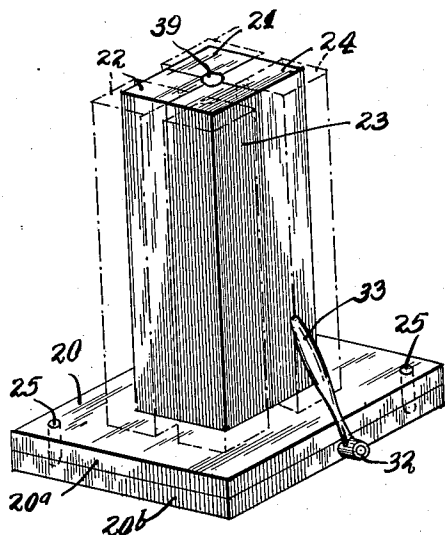


Fig. 8

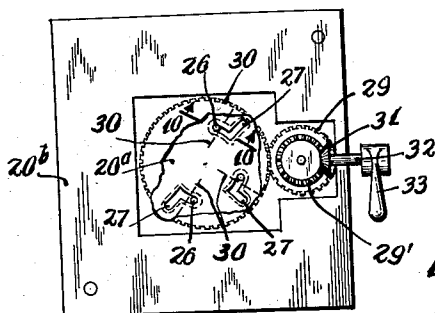


Fig. 9

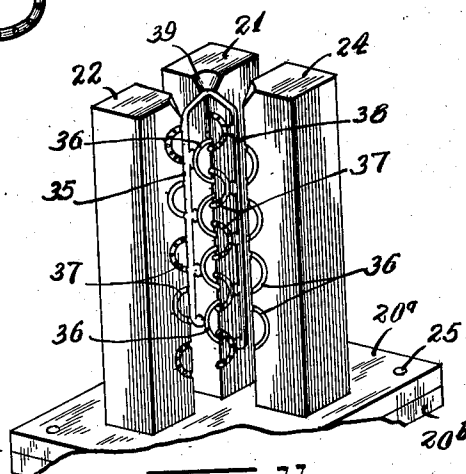


Fig. 11

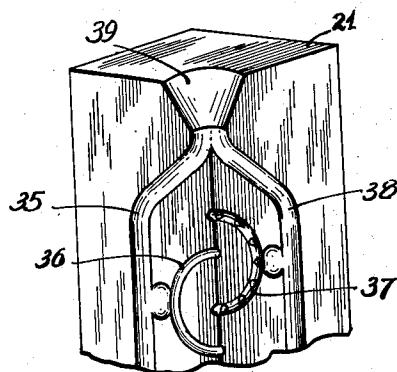


Fig. 12

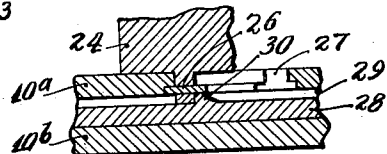


Fig. 10

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UNITED STATES PATENT OFFICE

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APPARATUS FOR CASTING INTERLOCKING RINGS

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Application December 2, 1935, Serial No. 52,547

2 Claims. (Cl. 22—137)

This invention relates to new and useful improvements in apparatus for casting interlocking rings.

The invention has for an object the construction of dies which are capable of casting interlocking rings in one or two operations thereof.

More particularly, with reference to the die for casting the interlocking rings in two operations, it is proposed that in the first operation spaced rings be cast, and in the second operation other spaced rings be cast through the first-mentioned group of rings.

In the form of one invention in which the interlocking rings are to cast in one operation, it is proposed that the rings be simultaneously cast in interlocking relation to each other.

Another object of the invention is the construction of a device as mentioned which is simple and durable and which can be manufactured and sold at a reasonable cost.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure;—

Fig. 1 is a perspective view of a die constructed according to this invention.

Fig. 2 is an elevational view of the rear section of the die shown in Fig. 1.

Fig. 3 is a perspective view of Fig. 2 illustrated with the elements of the die sections shown in Fig. 2 separated.

Fig. 4 is a horizontal sectional view taken on the line 4—4 of Fig. 2.

Fig. 5 is an elevational view of the first group of spaced rings cast by the dies.

Fig. 6 is an elevational view of the first and second groups of rings interlocked with each other.

Fig. 7 is an elevational view of the rings shown in Fig. 6 separated from the casting body.

Fig. 8 is a perspective view of a die constructed according to a modification of the invention.

Fig. 9 is a plan view of Fig. 8 with a top portion thereof broken away.

Fig. 10 is a fragmentary enlarged sectional view on the line 10—10 of Fig. 9.

Fig. 11 is a perspective view of the die shown in Fig. 8 with elements thereof separated.

Fig. 12 is a fragmentary enlarged detailed view of one of the elements of the die shown in Fig. 11.

The die for casting interlocking rings, accord-

ing to this invention, comprises a front section 10 consisting of an upper element 10^a in edge contact with a lower element 10^b, and a rear section 11 consisting of an upper element 11^a in edge contact with a lower element 11^b. The upper and lower elements are respectively in edge contact with each other. There are ring shaped passages 12 in the adjacent faces of the sections 10 and 11, and having portions 12^a and 12^b thereof in the upper and lower elements of said sections. These passages are connected by passages 13 for the supply of metal thereto. The passages 13 are connected together and terminate in an opening 13^a in the edge of the die sections.

Ring shaped passages 14 are formed in the contacting ends of the upper and lower elements 10^a, 11^a and 10^b, 11^b and are arranged with portions thereon in adjacent sections. At one side there are passages 14^a which connect with the passages 14 through which spaced rings, held by metal which flow through the passages 13, may engage. The upper and lower elements of the sections are held in relatively adjusted positions by studs 16 which are attached to one of the elements and slidably engage through openings in the other of the elements and have their extended ends formed with heads 17 to limit the relative motion of the parts.

One of the sections, namely the section 10 is provided with a stud 17' by which it may be gripped whenever desired. The method of making the rings, according to this form of the invention is as follows:—Molten metal is poured through the opening 13^a when the die is in the closed position, as illustrated in Fig. 1, to form the casting shown in Fig. 5. This casting comprises spaced rings 12' which are held together as a unit by arms 13' formed by the metal engaging in the passages 13 and 13^a. This casting, when removed from the die, is placed horizontally between the upper and lower elements. This is possible by first separating the upper and lower elements as shown in Fig. 3.

The rings 12' should fit right into the passages 14 and the arms 13' should extend out from the passages 14^a. The die is then closed and molten metal is poured through the opening 13^a which now forms a second casting identical to the casting shown in Fig. 5, except for the fact that its rings 12' are threaded through the rings 12' of the first casting. When the casting is now withdrawn from the mold it will be in the condition shown in Fig. 6.

The dot and dash lines in Fig. 4 illustrate the manner in which the arms 13' extend from the

side of the die. The arms 13' are then broken off from the rings and the finished interlocking ring chain shown in Fig. 7 is produced.

In Figs. 8-12, inclusive, another method and die is shown for casting the interlocking rings in one operation. According to this form of the invention there is a base 20 upon which there is fixedly mounted a die section 21 which is adapted to coact with several movable die sections 22, 23 and 24. The base 20 consists of a pair of superimposed plates 20^a and 20^b held together in proper alignment by studs 25 from one of the sections engaging in apertures in the other. The fixed vertical section 21 is merely fixedly attached at its bottom end on the plate 20^a.

The movable sections 24 have headed studs 26 projecting from their bottom ends and engaging in bayonet slots 27 formed in the top base section 20^a. These bayonet slots each comprise a circumferential portion joining with a radial portion so as to form an L-shape. This is very clearly shown in Fig. 9. The L-shapes are disposed with the radial arms extending outwards. A disc 28 is rotative within a cavity 29 between the sections 20 and 20^b. This disc has several radial ribs 30 adapted to engage the headed studs 26 to force them into the ends of the bayonet slots for locking the vertical sections 22, 23 and 24 into closed positions.

The disc 28 has peripheral teeth which mesh with the teeth on a gear 29 rotatively mounted and coaxially connected with a bevel gear 29', in turn meshing with a bevel gear 31 on a stem 32 extending to the exterior of the base.

A handle 33 is fixed on the stem 32 by which it may be turned. This arrangement permits the headed studs of the vertical sections to be latched in the closed positions of the sections or moved so that the sections are slightly separated. In Fig. 8 the full lines indicate the vertical sections closed, while the dot and dash lines indicate the separated positions of the three movable sections. In Fig. 11 a fragmentary view is shown to illustrate the manner in which two of the movable sections are spaced from the stationary section in the open condition of the die.

The contacting faces of the sections are formed with passages adapted to form the interlocking rings. More particularly, section 21 has a passage 35 connecting with passages 36 for forming half rings which are straddled from other rings 37 in walls which are at right angles to the half rings 36. These latter passages 37 connect with passages 38 which extend upwards and join with the passages 35 in an opening 39. The half rings 37 of each of the sections are adapted to align with the half rings of the adjacent sections in such a manner that the interengaging rings are formed when metal is poured into the die. This may be very clearly understood by examining Fig. 11 and noting the manner in which the half ring passages are adapted to align with each other when the vertical sections are moved closed. It will thus be seen that with one pouring operation through the opening 39 the interlocking rings are formed. When the casting is removed from the die, it is necessary that the metal formed in the passages 35, 38, and 39 be broken free from the rings.

It is to be understood that the interlocking links cast by this arrangement may be of white metal or any other pourable metal or plastic material, also that the links may be of any desired size and ornamentation.

While I have illustrated and described the preferred embodiments of my invention, it is to be understood that I do not limit myself to the precise constructions herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent is:—

1. A die for casting interlocking rings, comprising a base having a hollow interior and including a pair of superimposed top and bottom plates, said top plate having L-shaped bayonet slots one of the arms of which are on the circumference of a circle and the other arms of which extend radially therefrom, a vertical section mounted on said base, three vertical sections adjustably mounted on said base and movable into contact with each other, and with said stationary vertical section, and said sections having their faces in planes at right angles, said section having ring shaped passages in the faces on one of said planes and also having other ring shaped passages in the faces of the other of said planes and spaced and interlocked with said first ring shaped passages, and means for releasably holding said movably mounted sections on said base, comprising a disc having peripheral teeth and mounted within said hollow interior, headed studs mounted on the ends of said movable sections and engaging through said slots and adapted to abut the top surface of said disc, and radial ribs on said disc adapted to force said studs into the ends of said arms on the circumference of a circle to hold said sections in their closed position so that said chain may be cast, and a means for rotating said disc to release said studs so that said sections may be moved apart to allow said chain to be removed after being cast.

2. A die for casting interlocking rings, comprising a base having a hollow interior and including a pair of superimposed top and bottom plates said top plate having bayonet slots and one of the arms of which are on a circumference of a circle and another arm at right angles to said arm and extending radially therefrom, a vertical section mounted on said base, three vertical sections adjustably mounted on said base and movable into contact with each other and with said stationary vertical section, and said sections having their faces in planes at right angles, said section having ring shaped passages in the faces on one of said planes and also having other ring shaped passages in the faces of the other of said planes and spaced and interlocking with said first ring shaped passages, and means for releasably holding said movably mounted sections on said base, comprising a disc having peripheral teeth and mounted within said hollow interior, headed studs mounted on the ends of said movable sections and engaging through said slots and adapted to abut the top surface of said disc, and radial ribs on said disc adapted to force said studs into the ends of said arms on the circumference of the circle to hold said sections in their closed position so that said chain may be cast, and means for rotating said disc to release said studs so that said sections may be manually moved apart to allow said chain to be removed after being cast.

MAURICE RICH.