

Jan. 5, 1937.

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2,066,658

METHOD OF MAKING VALVES

Filed Dec. 10, 1932

2 Sheets-Sheet 1

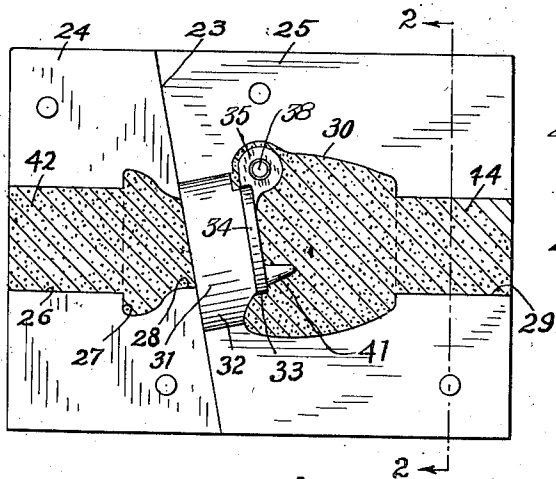


Fig. 1.

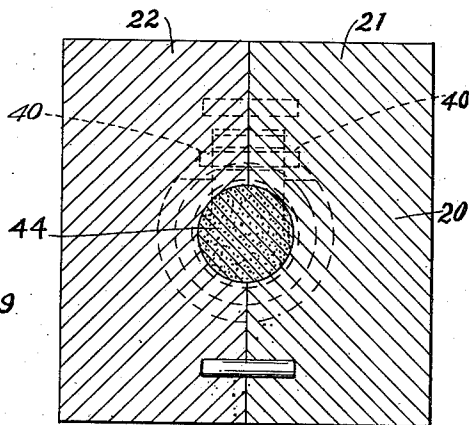


Fig. 2.

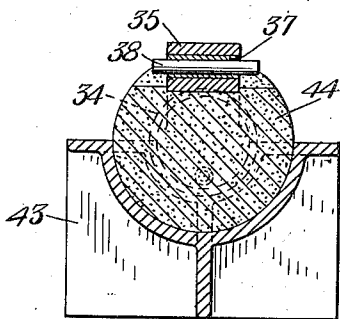


Fig. 4.

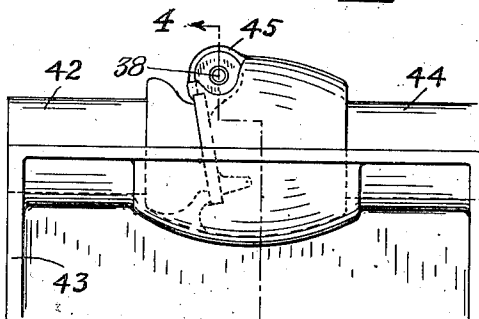


Fig. 3.

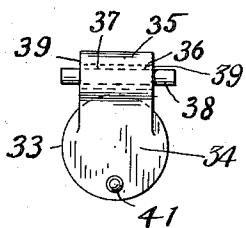


Fig. 5.

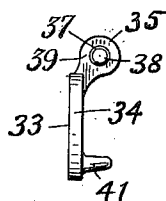


Fig. 6.

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2 Sheets-Sheet 2

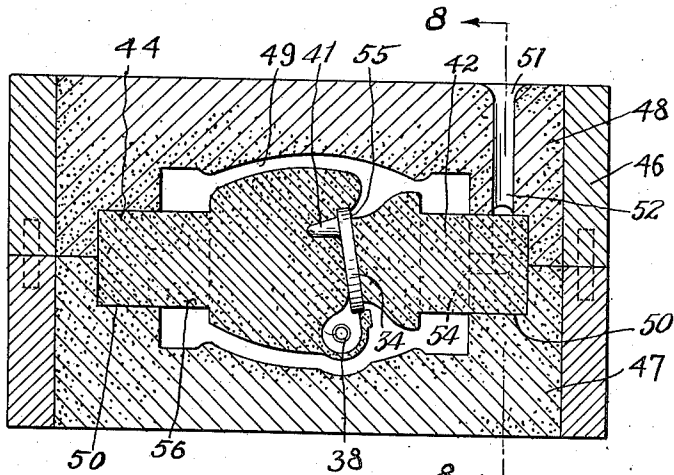


Fig. 7.

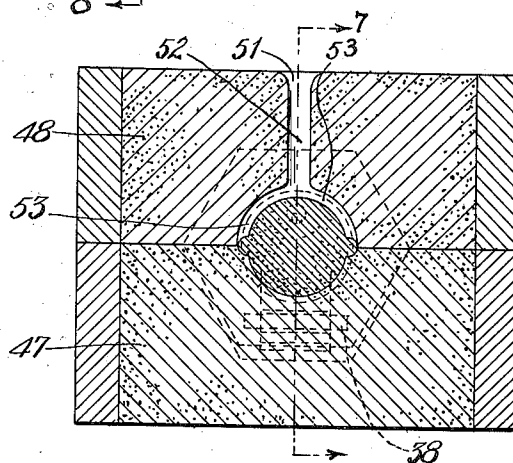


Fig. 8.

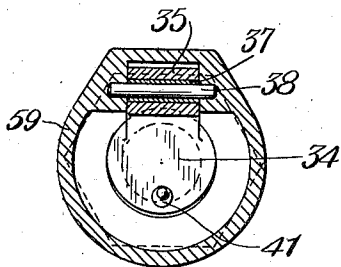


Fig. 9.

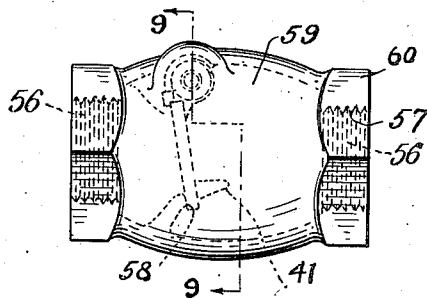


Fig. 10.

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METHOD OF MAKING VALVES

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Application December 10, 1932, Serial No. 646,634

6 Claims. (Cl. 22-203)

This invention relates to valves and is particularly directed to a new and improved method in the casting thereof.

An object of the invention is to produce valves of the pressure type, preferably by such method, with the result that a great saving in the cost of production is effected without impairing the quality and efficiency thereof.

Another object of the invention resides in the production of a valve having a pivoted gate or valve member which is secured within the valve body in operative position during the casting operation.

With the objects above indicated and other objects hereinafter explained in view, the invention consists in the valve structure as an article of manufacture and the method of producing the same.

Referring to the drawings:

Figure 1 is a top plan view of the drag of a core mold;

Fig. 2 is a sectional view taken on line 2-2 of Fig. 1;

Fig. 3 is a side elevational view of a jig with a core supported therein;

Fig. 4 is a sectional view taken on line 4-4 of Fig. 3;

Fig. 5 is a front view of a pivoted gate or valve member;

Fig. 6 is a side view of that shown in Fig. 5;

Fig. 7 is a longitudinal sectional view of a valve mold taken on line 7-7 of Fig. 8;

Fig. 8 is a sectional view taken on line 8-8 of Fig. 7;

Fig. 9 is a sectional view of a cast valve embodying the present invention taken on line 9-9 of Fig. 10, and

Fig. 10 is a side view of the cast valve in its finished condition.

In describing the method of casting a valve embodying the present invention, it should be understood, of course, that initially suitable patterns are made in the usual manner and as the making of these patterns has no bearing upon the present invention, description of the same is eliminated.

In the drawings 20 represents generally a core mold comprising a drag 21 and a cope 22, within which has been previously formed cooperating cavities in the drag and cope of a contour simulating the interior of the finished valve. The core mold 20 is further divided transversely at 23 into units 24 and 25 for the purpose of permitting the core to be formed in half portions, and angularly, for a purpose to be later described.

The unit 24 has a cylindrical core cavity 26 extending longitudinally, the inner end of which is enlarged at 27 and terminates in a smaller diameter at 28, as clearly shown in Fig. 1. The unit 25 has a cylindrical core cavity 29 in longitudinal alignment with the core cavity 26 and adjacent its inner end is of enlarged diameter as at 30, terminating, however, short of the end adjacent the division 23.

A removable circular plug 31 is positioned within a correspondingly shaped opening 32 provided in the inner end of the unit 25 and has its inner end 33 formed of reduced diameter and its inner surface extending in a plane parallel with its outer surface and with the angular inner end of the unit 25.

A previously cast or otherwise formed gate or valve member 34 has an integral cylindrical extension 35 provided with a longitudinally extending opening 36, within which is secured a bushing 37 of any suitable material. A pin 38 is loosely disposed within the bushing 37 and has its opposite ends extending beyond the ends of the cylindrical extension 35. This pin 38 is preferably made of stainless steel, so as not to be affected by the heat of the molten metal during the casting of the valve. Furthermore, to insure against securing of the gate or valve member 34, during the casting operation the opposite end surfaces of the extension 35 are coated with a lubricant at 39, such as graphite paste, and also the portion of the pin 38, within the extremities of the bushing 37, may be likewise coated if found necessary.

In forming the core, the gate or valve member 34 is positioned within the unit 25 and properly located by means of aligned openings 40 in the drag and cope of the mold, which receive the extended ends of the pin 38. These openings 40 are so located as to permit one face of the gate or valve member 34 to engage with the angular inner surface of the plug 31, as clearly shown in Fig. 1, which thereby maintains the gate or valve member 34 in its desired angular position. The gate or valve member 34 has an integral extension 41 formed at its lower portion, which serves the dual purpose of providing sufficient weight to maintain the valve member in normally closed position, as will be later described, and to limit its opening movement. With this gate or valve member 34 properly positioned within the core mold, the parts of the core mold are moved into cooperating engagement and green sand is forced in at the opposite ends through the cylindrical openings 26 and 29 and

tamped in the customary manner. When the core is thus formed, the cope 22 is removed and the portion 42 of the core is placed upon one end of a jig 43, which is provided with a cavity 5
complementary to the contour of this portion of the core 42. The portion 44 of the core is likewise removed, with the gate or valve member 34 embedded therein, but after the plug 31 has been removed from the opening 32. The
10 portion 44 of the core is then placed upon the opposite end of the jig 43, which likewise has a cavity corresponding to the contour of this portion of the core and both portions of the core are then secured together by means of foundry paste applied to the engaging surfaces of
15 the portion 42 of the core and the outer surface of the gate or valve member 34. It will be noted that a portion 45 of the core extends around the cylindrical extension 35 on the gate or valve
20 member 34, so as to provide suitable clearance to afford ready pivotal movement of the valve member 34. Furthermore, the ends of the pin 38 project beyond the portions of the core and the core is so shaped as to provide pockets to
25 receive the molten metal for securing the ends of the pin.

A valve mold is generally indicated at 46 and comprises a drag 47 and a cope 48 and may be composed of green sand, or of a material of a
30 permanent nature as the case might demand. The drag and cope have complementary cooperating cavities 49, which simulate the contour of the finished valve body. Longitudinally
35 aligned bores 50 are provided in the drag and cope of the valve mold and are adapted to receive the cylindrical portions 42 and 44 of the core and to properly position the latter within the mold, as shown in Fig. 7. The core is preferably
40 positioned within the mold with the pin 38 at the bottom and this is to insure proper securement of the ends of the pin 38 within the valve body and is accomplished by directing the molten metal to this point first and while it is at its hottest temperature. A pouring gate
45 51 is provided in the cope of the mold and communicates with a passageway 52 which passes downwardly and is divided into branches 53, which extend around the upper surface of the cylindrical portion 42 of the core and then extend
50 inwardly at 54 into communication with the cavity 49.

When the molten metal is poured through the gate 51 it passes through the passageways and entirely fills the space between the cavity 49 of
55 the mold and the outer surface of the core, the metal flowing around the ends of the pin 38 securing the same therein, but without effecting the looseness of the pin within the cylindrical extension 35 upon the valve member 34. Furthermore, due to the lubricant upon the ends
60 of the cylindrical extension 35, the molten metal is prevented from adhering thereto.

As the inner diameter of the portion 42 of the core is less than the diameter of the valve

member 34, with which it engages, a space 55 is provided therearound which serves as a seat for the valve member. Due to this arrangement, it is unnecessary, for ordinary use, to machine the valve seat as the molten metal coming in
5 contact with the valve member 34 is chilled and consequently produces a hardened valve seat 58.

After the valve 59 has been cast, it is removed from the mold and the core is removed by the usual methods, such as tumbling or otherwise.
10 The valve body 60 has oppositely aligned openings 56 provided by the cylindrical ends 42 and 44 of the core and these openings may be interiorly screw-threaded at 57 after the entire casting operation is completed. The extension 41 of the
15 valve member 34 engages with the inner surface of the valve body and is thereby limited in its opening movement, which eliminates the possibility of the valve member binding or sticking due to being opened too far.
20

While I have described the preferred embodiment of the invention, it is to be understood that I am not to be limited thereto, inasmuch as changes and modifications may be resorted to without departing from the spirit of the inven-
25 tion as claimed in the appended claims.

Having thus described my invention, I claim:

1. The method of casting a valve which consists in forming a core about a gate having a
30 loosely mounted pin therein, positioning the core in a mold, and casting a valve body around said gate in a manner to secure the pin therein.
2. The method of casting a valve which consists in supporting a gate having a loosely mounted
35 pin therein, and casting a valve body around said gate in a manner to secure the end of the pin therein.
3. The method of casting a valve which consists in supporting a gate having a stainless steel
40 pin loosely mounted therein, and casting a valve body around said gate in a manner to secure the end of the pin therein.
4. The method of casting a valve which consists in supporting a gate having a bushing with
45 a pin loosely mounted therein, and casting a valve body around said gate in a manner to secure the end of the pin therein.
5. The method of casting a valve which consists in supporting a gate having a bushing with
50 a pin loosely mounted therein, applying a lubricant to portions of the gate adjacent the pin, and casting a valve body around said gate in a manner to secure the pin therein.
6. The method of casting a valve which consists in forming a core in sections with a gate
55 mounted upon the inner end of one of said sections, securing the inner end of the other of said sections to the exposed surface of said gate, said gate having a pin loosely mounted therein, positioning the core in assembled relation in a
60 mold, and casting a valve body around said gate in a manner to secure the pin therein.

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