

April 7, 1925.

1,533,010

H. M. KINSLOW

PATTERN

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Fig. 1.

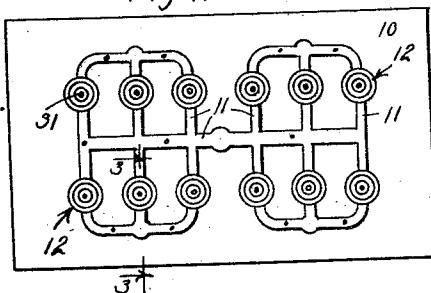


Fig. 2.

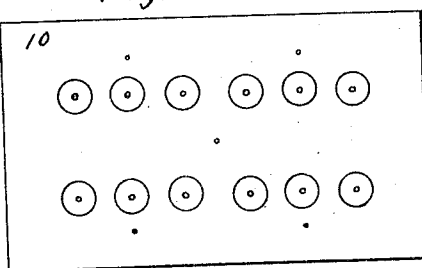


Fig. 3.

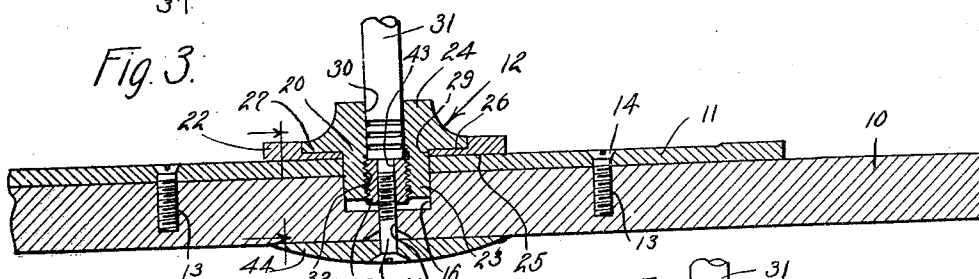


Fig. 4.

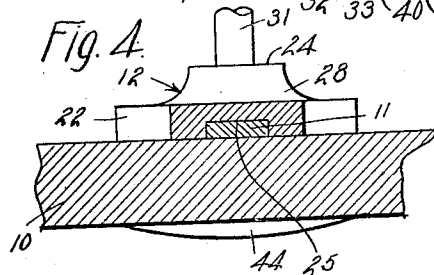


Fig. 5.

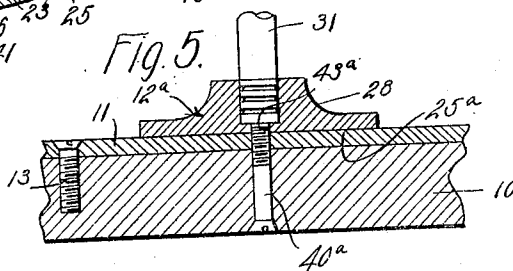


Fig. 6.

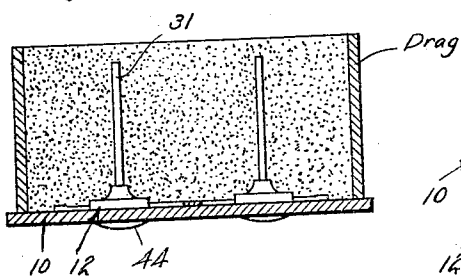
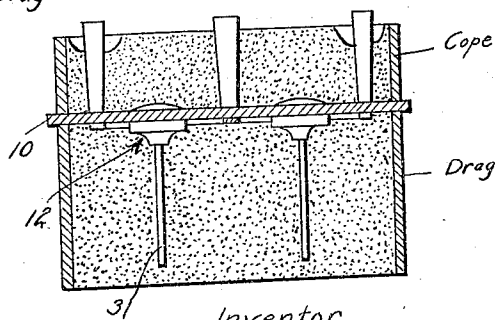


Fig. 7.



Inventor
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by *W. H. Maxwell*
his Attorney

UNITED STATES PATENT OFFICE.

HENRY M. KINSLOW, OF SANTA ANA, CALIFORNIA.

PATTERN.

Application filed December 7, 1922. Serial No. 605,368.

To all whom it may concern:

Be it known that I, HENRY M. KINSLOW, a citizen of the United States, a resident of the city of Santa Ana, in the county of Orange and State of California, have invented new and useful Improvements in Patterns, of which the following is a full, clear, and accurate description.

This invention has to do with a pattern and is particularly applicable to that class of pattern known as a gated pattern, and it is an object of the invention to provide a pattern construction which is simple and effective, and which permits of the size and proportions of the pattern proper being readily varied with very little inconvenience and at very little expense.

Gated patterns, such as are employed in the manufacture of various articles and machine parts, usually comprises a plate carrying a plurality of patterns proper and having ribs which form the channels to carry the metal into the molds formed by the patterns proper. Gated patterns of this general type are usually formed of metal, it being most common to cast them as a unit from a wooden pattern. It is, of course, necessary that a metal pattern, cast from a wooden pattern, be finished or surfaced, which operation must usually be done by hand as very few patterns are of such form or configuration as to permit of their being finished by machine. Further, it is in practice extremely difficult to obtain a perfect metal pattern in the usual manner as it is practically impossible to cast a flat comparatively thin plate, such as is employed in a gated pattern, so that it is of uniform thickness throughout. Even though the original wooden pattern is carefully made and designed to overcome this difficulty it is found that the metal draws to the edges of the plate as it cools leaving the middle portion thin. Further, metal gated patterns when once formed and finished are not useful in the manufacture or production of articles other than the specific ones which will be formed by the patterns proper, which are integral with them. In other words, with an ordinary metal gated pattern it is impossible, or, at least, impractical, to increase or decrease the size of the article being produced, or the proportions of the article. In practice, when it is desired to

change the size or proportions of the article, the gated pattern is completely rebuilt or a complete new pattern is made. The rebuilding of a pattern may make it applicable to casting the new article, but usually ruins it for casting any other article and puts it in condition where it cannot be effectively rebuilt. The construction of a new pattern to cast the new article, of course, necessitates considerable labor and expense, as gated metal patterns are comparatively expensive. Certain devices and machine parts—for example—poppet valves of the type used in internal combustion engines, are made in a wide variety of sizes and proportions and, therefore, for their economical manufacture, ordinarily require one or more patterns for each size and differently proportioned device. In the case of poppet valves, such as are used in internal combustion engines of the automobile type, there is at present an extremely large demand for cast iron head valves in an almost infinite number of sizes and varieties of proportions. With the ordinary type of gated pattern and with ordinary methods, a person engaged in the manufacture of cast head valves to supply this demand must supply himself with a great number of gated patterns in order to be able to economically produce these devices.

The present invention is concerned generally with a construction and formation of gated pattern, and in its practical application is particularly applicable to a gated pattern for the formation of poppet valve heads, and the like. In the present disclosure I will refer to a pattern embodying the present invention, which is designed particularly for forming poppet valve heads on stems, but I do not thereby mean to specifically limit the scope of my invention to such a specific application. It is to be understood, therefore, that when I make specific reference to a poppet valve that I am making such reference mainly for the purpose of illustration and intend that the invention be used or carried out in accordance with the principles I herein set forth in the manufacture of numerous other articles or parts, such as will readily suggest themselves.

It is an object of this invention to provide a pattern proper including parts which are replaceable and capable of being inter-

related in various manners for the purpose of changing the size or proportions of the pattern without in any way rebuilding or structurally altering the pattern or injuring it. In the case of a pattern for the formation of a poppet valve head the present invention provides for the production with a single pattern of valves of different diameters, of different thickness, different sized stems, or of different proportions, etc.

Another object of my invention is to provide a pattern construction which readily permits of the various parts being produced and machined accurately and in a particularly inexpensive manner.

The various objects and features of my invention will be best and more fully understood from the following detailed description of a typical application of the invention, throughout which reference is had to the accompanying drawings, in which—

Fig. 1 is an elevation of the drag side of a gated pattern of the more or less ordinary type embodying the present invention;

Fig. 2 is an elevation of the other, or cope, side of the pattern shown in Fig. 1;

Fig. 3 is an enlarged detailed sectional view of one unit of the pattern, being a view taken as indicated by line 3—3 on Fig. 1;

Fig. 4 is a detailed sectional view taken as indicated by line 4—4 on Fig. 3;

Fig. 5 is a view similar to Fig. 3, showing another form of construction embodying the present invention; and

Figs. 6 and 7 are views illustrating the manner in which the pattern is used in forming the impressions in the mold.

The pattern embodying the present invention includes, generally, a plate, designated in the drawings by numeral 10, ribs 11 on the plate 10 to form metal carrying channels in the mold, and patterns proper 12. In Figs. 1 and 2 of the drawings I have illustrated a more or less typical form of gated patterns which includes a plurality of patterns 12 which are in combination with a series of ribs which will form channels in a mold so that the metal poured into the mold through the feed gauge will flow into and through the mold and into suitable risers. As far as the present invention is concerned it is immaterial as to how many patterns 12 are mounted on the plate 10, and as to the number and arrangement of the ribs 11. It is desirable, however, in the case of casting valve heads on to stems—as I hereinafter describe—that the ribs 11 be arranged and proportioned so that the metal will flow from the feed gate through or across the molds, and into the risers as the flow of metal through the molds will cause the valve heads being molded to fuse onto the stems. It is also to be understood that the several patterns 12 in a single gated pattern need not, as far as the present in-

vention is concerned, be the same, but may vary in size and proportions in the manner made possible by the present invention. For the purpose of facilitating a clear and concise understanding of my invention I will confine the following description to only one of the patterns 12, it being understood, of course, that such description may apply equally to all of the patterns of the device.

The plate 10, in accordance with the preferred form of my invention, is preferably a cast plate machined on both sides so that it is smooth and of perfectly uniform thickness throughout. It will be understood, of course, that the exact size and shape of the plate 10 will, in any given case, depend upon the size, number and arrangement of patterns 12 and ribs 11.

The ribs 11, although they may be cast or otherwise formed integrally with the plate 10, are preferably formed separately and are attached to the drag side of the plate 10, as by suitable screws 13 the heads 14 of the screws 13 are, of course, preferably counter-sunk so that they do not project from the ribs 11. In a device where it is desired to have two channels communicating with each mold, one for the purpose of carrying metal to the mold and the other for the purpose of carrying the metal away from the mold, there are two ribs 11 mounted on the plate 10 so that they extend to or from the pattern 12.

In the form of the invention illustrated in Figs. 3 and 4, the pattern 12 is mounted on the drag side of the plate 10 and the plate is formed at the point of mounting of the pattern 12 with a recess or socket 16. With this form of construction it is preferred that the ribs 11 extend to, or at least substantially to, the sockets 16, as I have clearly illustrated in Fig. 3 of the drawings.

The pattern 12, in accordance with the present invention, is detachably mounted on the plate 10 and overlaps the ribs 11. In the particular form of construction illustrated in Fig. 3 the pattern proper 12 includes two separable parts, one a hub part 20 and the other a flange part 22. The inner end portion 23 of the hub part 20 is adapted to extend into the socket 16 in the plate 10, while the outer portion 24 of the rib part projects outwardly from the plate beyond the flange part 22. The flange part 22 is a flat annular member formed with diametrically disposed recesses 25 on its inner side to receive the ribs 11 and formed with an annular recess 26 in its outer side to receive a flange 27, which extends from the hub part 20. The inner side of the flange 27 is shaped to accurately seat in the recess 26 while there is a fillet 28 in the corner between the flange 27 and the outer portion of the hub part 20. The flange part 22 is formed with a central opening

29 through which the inner portion 23 of the rib part passes. The recesses 25 in the inner side of the flange part 22 are shaped and proportioned so that they accurately and more or less closely receive the ribs 11. The outer portion 24 of the hub part 20 is provided with a central opening 30 adapted to receive the end portion of a valve stem 31. In the particular form of construction now under consideration the inner portion 23 of the hub part 20 is provided with a screw threaded opening 32 which in effect forms a continuation of the opening 30. The opening 32 is screw threaded and carries a plug 33 which can be adjusted as to position in the opening 32 to vary the amount that the valve stem can be extended into the hub part.

In accordance with the preferred form of the invention the pattern 12 is detachably mounted on the plate 10 by means of a screw 40 which extends into the socket 16 through an opening 41 in the plate 10 from the cope side of the plate and screw threads into an opening 43 provided in the plug 33. When it is desired that the head cast on the stem be crowned a suitable crown washer or filler 44 is arranged at the cope side of the plate and is held in place by the screw 40, as clearly illustrated in Fig. 3. It is desirable, of course, that the filler 44 and that the plate 10 be counter-sunk so that the head of the screw 40 will not project from the filler or plate when the device is being used with or without the filler 44.

To form a mold to cast a head on a valve stem the pattern 12 is assembled, as I have illustrated in Fig. 3, a hub part 20 being employed which has an opening 30 which will properly receive the end of the valve stem and a flange part being used which is of the desired thickness and diameter. A filler 44 of the desired size and configuration is mounted on the cope side of the plate 10, if it is desired that the head be crowned. The plate 10 is arranged with the drag side up and the drag portion of the flask is arranged on it in the usual manner. The sand is then filled into the drag onto the drag side of the plate and around the pattern and the valve stem in the usual manner and as illustrated in Fig. 6. The drag and plate are then reversed and the cope portion of the flask arranged in place at the cope side of the plate 10, pins or posts are then arranged in position to form the feed gate and the risers and then the sand is filled into the cope and onto the cope side of the plate 10 in the usual manner. Upon removal of the pins, separation of the cope from the plate 10, removal of the plate from the drag, placement of the cope on the drag, the mold is formed with the valve stem embedded in the drag and extending into the mold so that the head will be cast on the end of the

stem. This particular manner of handling the pattern in connection with an ordinary cope and drag flask is, of course, simply a typical manner in which the pattern may be handled and is by no means the only one.

From the foregoing description it will be obvious how a gated pattern constructed in accordance with the present invention may be readily set or made applicable to forming heads of various sizes and proportions on valve stems of various sizes by employing hub parts 20 of different sizes and configurations and flange parts 22 of different sizes and configurations. I have found in practice that by providing a set of hub parts 20 of different sizes and configurations and a set of flange parts 22 of different sizes and configurations, that I can interchange and combine them to obtain a great variety of different sizes and proportions of valve heads. When I employ the form of construction which I have above described I form all of the hub parts 20 so that they can be properly mounted on the plate 10, and I form all of the flange parts 22 so that they will properly cooperate with any of the hub parts and will properly cooperate with or overlap the ribs 11. Further, from the foregoing description it will be obvious how the pattern 12 can be very easily removed from the plate, changed, and then rearranged as it is merely necessary to manipulate the screw 40 for the purpose of detaching and mounting the pattern. The parts of the pattern 12 are of simple inexpensive construction and can be readily finished in a lathe or automatic machine so that they will make smooth models.

In the form of the invention which I have illustrated in Fig. 5, the pattern proper 12^a is formed in a single piece, that is, the hub part and the flange part are integral and its inner side is flat so that it seats closely on the surface of the plate 10. As I have illustrated in Fig. 5 the ribs 11 extend to the point of mounting of the pattern 12 and the inner side of the pattern is provided with a diametrically disposed recess 25^a, which receives the ribs so that the pattern overlaps them in substantially the manner of the pattern hereinabove described. The pattern 12 illustrated in Fig. 5, is mounted on the plate 10 in a manner similar to the pattern illustrated in Fig. 3 by means of a screw 40^a which extends through the plate 10 from the cope side and screw threads into an opening 43^a provided in the pattern 12. This form of construction is obviously somewhat more simple than the form illustrated in Fig. 3, but requires new pattern 12 for every variation in size or proportioning of head.

Having described only a typical preferred form of my invention I do not wish to limit myself to the specific details hereinabove set forth but wish to reserve to myself any

changes or variations that may appear to those skilled in the art or which may fall within the scope of the following claims.

Having described a preferred form of my invention, I claim:

1. A pattern of the character described including, a plate, a rib on one side of the plate, and a pattern part detachably mounted on said side of the plate so that it overlaps a part of the rib.
2. A pattern of the character described including, a plate, two ribs arranged on one side of the plate so that they are substantially end to end, and a pattern part detachably mounted on said side of the plate so that it overlaps the adjacent ends of the ribs.
3. A pattern of the character described including, a plate, a rib on one side of the plate, a pattern part having a recess in its inner side adapted to receive the rib, and means for detachably mounting the pattern part on said side of the plate so that the end of the rib extends into the recess.
4. A pattern of the character described including, a plate, a rib on one side of the plate, a pattern part including a hub part and a flange part releasably carried by the hub part, and means for detachably mounting the hub part on the plate so that the flange part overlaps the rib.
5. A pattern of the character described including, a plate, a rib on one side of the plate, a pattern part detachably mounted on the plate to overlap the rib, the pattern part having a socket to receive a part to be left in the mold, and means for adjusting the size of the socket.
6. A pattern of the character described

for casting a valve head on a stem including, a plate, a rib on one side of the plate, and a head pattern adapted to be removably mounted on the plate including a hub part having an opening to receive the stem and a flange part having a recess adapted to receive the end of the rib so that the pattern overlaps the rib.

7. A pattern of the character described for casting a valve head on a stem including, a plate having a socket in one side, ribs on said side of the plate extending to opposite sides of the socket, and the plate having an opening through it at the socket, a head pattern including two detachable parts one a hub part having an inner portion adapted to extend into the socket in the plate the other a flange part having recesses adapted to receive the ribs, the hub part having an opening through it to receive the stem at the outer end portion of said hub part, a plug screw threaded into the inner portion of said opening, said plug having a screw threaded opening in it, a crowned washer adapted to be arranged on the other side of the plate opposite the pattern, and a screw arranged through the washer, the opening in the plate, and screw threaded into the opening in the plug to releasably mount the pattern and washer on the plate.

In witness that I claim the foregoing I have hereunto subscribed my name this 17th day of November 1922.

HENRY M. KINSLOW.

Witnesses:

D. N. KELLY,
SOPHIE PRIESS.