May 2, 1944. S. A. YOUNG 2,348,173

METHOD OF PRODUCING FAUCET BODIES OR THE LIKE

Filed April 3, 1941

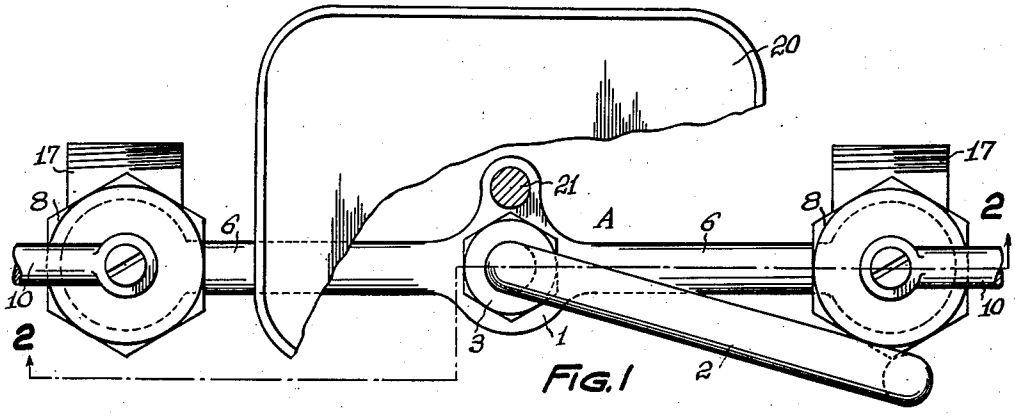


FIG. 1

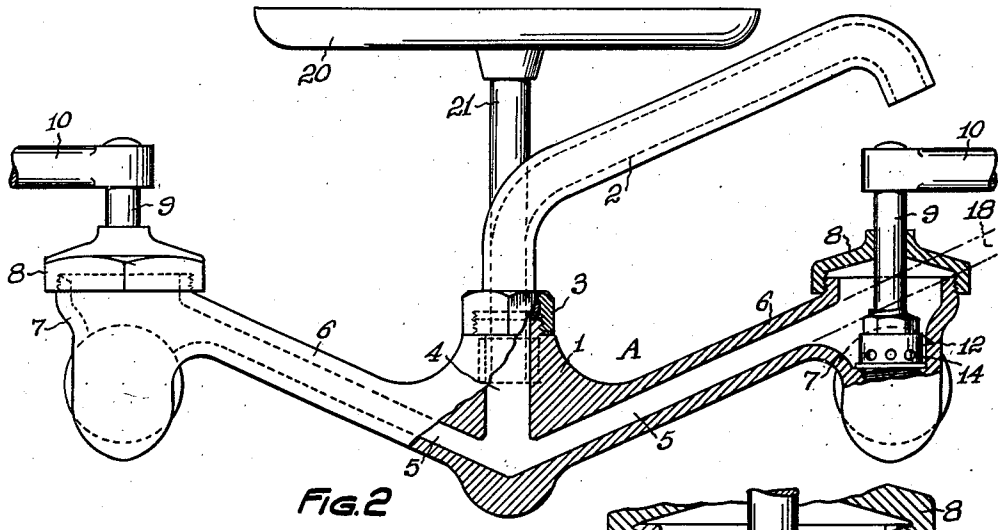


FIG. 2

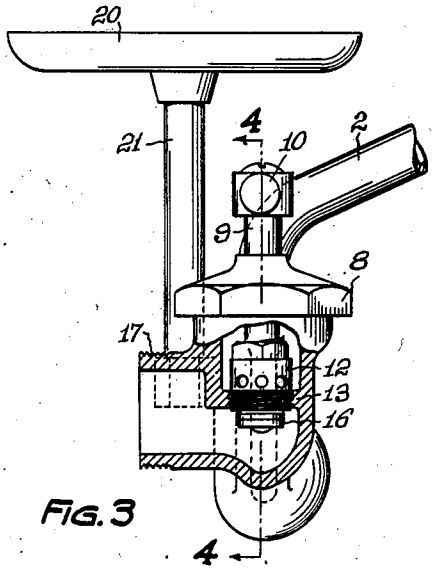


FIG. 3

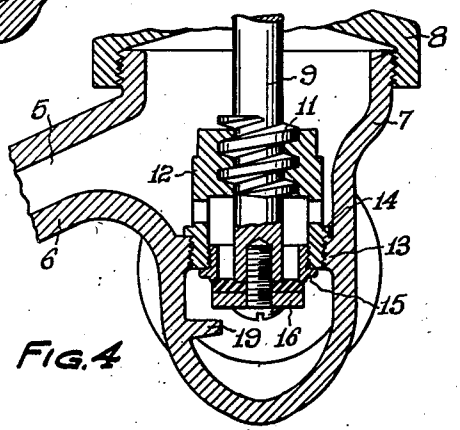


FIG. 4

INVENTOR:
Stephan A. Young
BY Robb & Robb
ATTORNEYS.

Patented May 2, 1944

2,348,173

UNITED STATES PATENT OFFICE

2,348,173

METHOD OF PRODUCING FAUCET BODIES OR THE LIKE

Stephan A. Young, Delphi, Ind., assignor to Globe Valve Corporation, Delphi, Ind., a corporation

Application April 3, 1941, Serial No. 386,707

1 Claim. (Cl. 22—200)

This invention relates to plumbing fixtures in the nature of faucets and particularly the type of faucet which is today designed and used on sinks, commonly known as a sink fixture, and to the art of manufacturing such faucets or fixtures.

At the present time it is well known that plumbing fixtures of the above type are made by foundry casting practice. In producing the fixture castings by the ordinary foundry practice employing sand cores, the process of making the casting and finishing the same to the highly finished condition necessary for fixtures of this kind is long and expensive. The chief difficulty that arises in production of the type of fixtures mentioned by foundry practice is incident to the fact that it is impossible to predetermine the costs involved in making the castings, due, primarily, to the losses in castings. In other words, it has been found impossible to make perfect all foundry castings since the very practice in the casting production results in defective or imperfect castings due to the detrimental effect on the castings by reason of the necessary employment of sand cores in the casting operation. The material of the sand cores disintegrates to some extent and the very nature of this type of core tends to produce slight imperfections in the surface structure of the casting, the foundry casting operations also commonly causing the production of "leakers," blows, and imperfect metal surfaces due to the porosity of the metal structure and other conditions well known in this art of molding articles.

For the above reasons, in foundry casting of fixtures of the type stated, no two runs of cast articles produced in the foundry will have the same percentage of defects or imperfect castings, or losses. Sometimes the losses are high in respect to the ejected castings and sometimes lower, all depending upon the conditions appertaining to the particular casting operation, but in all instances the necessity for rejection of castings is present and of course creates losses that necessarily should be avoided if possible so to do.

Another difficulty in the production of fixtures of the type referred to is the requirement that these fitxures of the type referred to is the requirement that these fixtures be machined or surface-finished after the castings are made, at great relative expense considering the general cost of the production operation and oft-times the defects or imperfections of the castings are not readily visible or ascertainable until the finishing work has been performed, this usually involving the chrome nickeling or final finish that is applied to the article in order to complete it for commercial sale. Obviously, when the article has been finally finished and then has to be rejected, there is a considerable loss in the final finishing operations that if possible is highly desirable to avoid.

A primary object of this invention has been to design a fixture of the type stated which may be produced by what is commonly known as die or pressure casting, which, so far as I am aware, has not heretofore been available to be used in lieu of casting by ordinary foundry practice, primarily due to the fact that the cored openings or passages in the casting are so shaped that it has been heretofore impracticable to make such openings or passages by any other than sand cores. This is due to the peculiar formation of the openings and passages such that they ordinarily involve curved sections, passages, openings, and the like that cannot be formed in the casting other than by the use of sand core practice.

Exemplifying the foregoing by reference to the ordinary type of sink fixture or mixing faucet, it is notable that such a faucet as universally made today involves the employment of a body in the central portion of which is carried a spout communicating with the hot and cold water passages in the body of the faucet. The said hot and cold water passages extend in opposite directions from the central portion of the portion of the body carrying the spout and are formed with cast on valve casings at their outer ends which in turn are provided with the usual coupling sections to be screw connected with the water supply pipe. The body of the fixture including the outflow passage, central portion, inflow passage, end portions, and the end cast on valve casings is made of a single unitary casting.

Now in these fixtures as designed at the present time, it would be impossible to use straight cores such as necessary to be employed if die or pressure casting practice is resorted to because the body structure of the faucet renders impossible the use of such cores owing to the angularity of the passages therein. Therefore, heretofore it has been impossible to produce a faucet or fixture of the type mentioned without recourse to sand core casting processes. In fact, so far as I am aware, today, no faucets are being made availing of the die or pressure casting process in which the complete casting for the

body of the faucet is made by such last mentioned process.

Now according to my invention, I have designed a faucet or fixture of the type used for sink purposes and generally referred to above, that is of a structure permitting the employment of pressure or die casting in the manufacture thereof.

If faucets or fixtures of the type referred to are susceptible to the manufacture or pressure die casting method, tremendous savings in the manufacture of the articles will be effected. Elucidating this matter, it is known that in using pressure or die casting, the castings made are in substantially finished condition when the casting operation is completed. This is due of course to the fact that the die castings are made under such high pressure usually with the use of solid dies and cores that the ordinary imperfections or defects that are caused by the foundry practice are substantially entirely eliminated and the loss or wastage incident to defective castings practically wholly avoided. Likewise, the die castings for faucet fixtures of the type herein referred to, made of brass or zinc, can be finished after the die casting operation with chrome nickel or any other suitable finish desired without any other preliminary preparation of the castings and without the necessity of special finishing operation subsequent to the application of chrome nickeling or other type of finish.

My invention therefore comprises a novel form of faucet fixture so designed as to enable the same to be completely cast in one unit by the pressure or die casting process.

My invention furthermore comprises a special form of fixture in which I use valves and seats for controlling the admission of the fluid to the body of the fixture wherein the pressure of the fluid in the valve casing acts to maintain the valve closed as distinguished from the ordinary types of faucet fixtures at present in use wherein the pressure tends to open the valve or valves from the seats provided therefor.

My invention involves, furthermore, a method of forming faucet fixtures so as to enable the casting thereof by pressure or die casting processes.

For a full understanding of the invention, reference is to be had to the accompanying drawing, in which—

Figure 1 is a top plan view of a sink fixture or faucet embodying the invention, the soap tray partly broken away to illustrate the faucet structure per se primarily.

Figure 2 is a sectional view of the fixture looking from the front thereof and the section being taken approximately on the line 2—2 of Figure 1 so that a portion of the fixture is shown in front elevation.

Figure 3 is a view partially in section and partially in elevation, and partially broken away, looking at the fixture toward an end thereof.

Figure 4 is a fragmentary sectional view taken approximately on the line 4—4 of Figure 3 and showing more clearly the means for supporting one of the water controlled valves in its valve casing.

In a general way, as to the body structure of my fixture which is illustrated as the type of the ordinary sink fixture with associated soap tray, the parts conform largely to those at present in use, with the primary exceptions that I employ a special type or formation of the body of the fixture and additionally use, as previously suggested, a novel type of valve means designed for the purpose previously mentioned. Specifically describing the structure of the fixture, A generally denotes the body of the same which is composed of the central outflow passage portion 1 which supports the spout 2 which has swivelled water tight connection at 3 with said central portion 1, the latter projecting upwardly to the point where the spout is connected thereto and carried thereon. The water passage 4 in the central portion 1 of the body A is a straight vertical cored passage and terminates at its lower end in communication with the oppositely extending water supply passages 5 formed in what will be called the hollow arms or end portions 6 of the body A. At the outer extremities thereof the ends or arms of the body A are provided with valve casings 7, each casing being equipped with the usual cap or bonnet 8 through which the valve stem 9 passes by the provision of suitable water tight packing between the stem and the cap that may be conventional according to the art. The stem 9 carries the customary valve handle 10 which may be of any desired type and located at the upper end of the member 9. At its lower portion the stem 9 is equipped with a screw thread 11 which is adapted to screw in a threaded opening at the upper portion of the supporting member 12 provided for the valve stem 9. The supporting member 12 at its lower end is threaded so as to screw into the surrounding threaded flange 13 formed near the lower portion of the valve casing 7 and said supporting member may have a shoulder 14 to limit its downward screwing movement. Within the lower end of the supporting member 12 is screwed a removable valve seat 15 according to the preferred construction thereof, though it is within the province of the invention to have the seat 15 integral with the member 12 if so desired.

At its lower extremity the stem 9 carries the valve 16 adapted to seat upwardly against the valve seat 15 as quite apparent from Figures 3 and 4. At the rear thereof each valve casing 7 has a threaded extension 17 for connecting with the water supply pipe with which the valve casing is to be associated and through which the water will be carried into the lower portion of the casing 7 upwardly past the valve 16 when the latter is open and thence through the passage 5 to the passage 4 and to the spout 2. Obviously, since the water will enter each valve casing 7 from the extension 17 passing upwardly to go to the passage 5, the pressure in the main line in the lower portion of the casing 7 is directed against the lower side of the valve 16 so as to tend to maintain this valve closed after it has been so adjusted by movement of the handle 10.

It is notable that the ends or arms 6 of the body A of the fixture diverge upwardly from one another and from central portion 1 of the faucet. The reason for this construction is to enable the passage 5 extending from the lower end of the passage 4 to be so arranged that the walls of these passages 5 will be in line with the spaces surrounded by the upper open ends of the casing 7. In other words, the line of the axis of each passage 5 is such that a straight solid core of the type necessary to be used in pressure or die casting processes, when disposed in the dies by which the fixture of the invention is made, will be so arranged that by a straight withdrawal movement of the core through the opening at the top of each valve casing 7, the core may be displaced. Figure 2 illustrates the foregoing by

showing in dotted lines the direction of movement of the core 13 roughly illustrated by dotted lines in respect to its mode of removal from the passage 5 on the right of the fixture, and it will be seen that there is no obstruction to such removal because of the angle of the arm or end portion 6 of the casting of the body A in relation to the outlet passage 4 and the opening at the top of the casing 7 when the bonnet or cap 8 is not in place over said opening. The outlet passage 4, being a straight cored passage, offers no difficulty to the removal of a suitable straight solid core in the casting operation, and each valve casing 7 is so constructed that the core means employed to shape the same may be similarly removed. For this reason, the threaded flange 13, previously mentioned as disposed in each valve casing, may be a separate member swaged or frictionally forced into position in the casing 7. Likewise, if desired, a lug 19, providing a limiting stop for the inward movement of the valve 16 under the manipulation of its handle 10, may be attached in the valve casing after the casting of the fixture has been completed. By the special formation of the ends of the body casting A of my fixture as described, as said formation relates to the central outlet extension or portion 1 of the casting, and in relation to the opening at the top of each valve casing 7, I am enabled to produce a fixture of the type of my invention by employment of pressure or die casting methods. This results in the advantages that have been outlined before, namely, that a substantially complete finished casting of the fixture may be effected, doing away entirely with the losses incident to imperfect foundry castings and avoiding the expense entailed in the use of such castings as regards the machining and finishing operations that have to be performed thereon under present conditions of manufacture.

The spout 2 will be preferably of a type inclined upwardly toward its delivery end so as not to interfere when swung laterally and rearwardly with the parts 7 and 10. The soap tray 20 depicted may be employed or not, as desired and is not a material feature of the invention. It will be mounted upon the fixture when used in the customary way, as by the removable stem 21.

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

In the art of producing faucet bodies, or the like, by pressure casting methods, wherein the faucet body to be produced shall include a water passage disposed at an angle to an open ended valve casing through which open end a valve control member is to be inserted, that improvement which consists in locating a core in the dies for forming the body having said water passage so that it is in alignment with the open end of the valve casing to be formed on the body so that the core may be withdrawn by longitudinal movement through the said casing opening, supplying the casting material to the dies under pressure to surround the core, and then displacing the core through the valve casing opening.

STEPHAN A. YOUNG.