

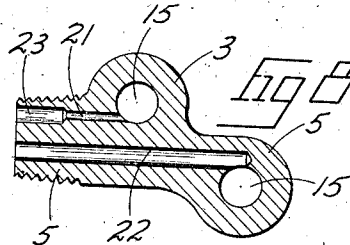
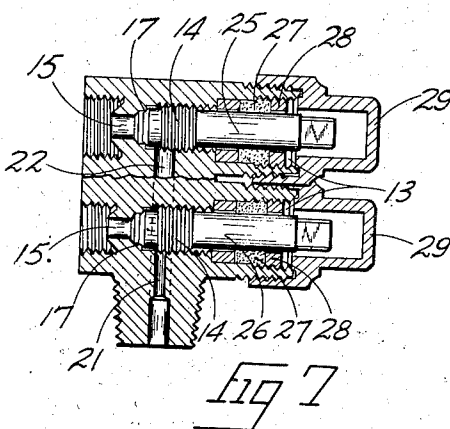
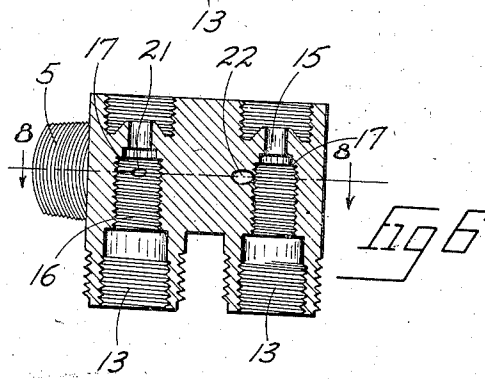
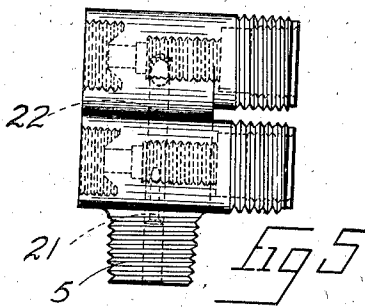
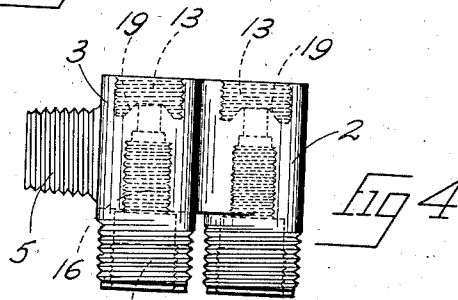
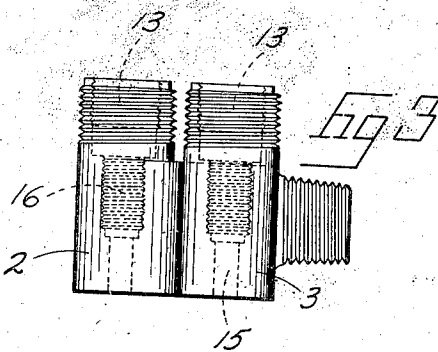
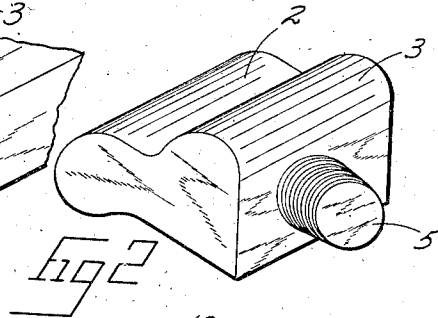
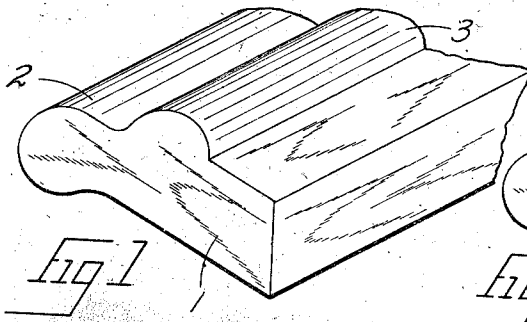
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J. D. BALDWIN, JR

2,078,048

VALVE

Original Filed April 27, 1932



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2,078,048

VALVE

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Original application April 27, 1932, Serial No.
607,787. Divided and this application April 30,
1934, Serial No. 723,042

2 Claims. (Cl. 277—46)

This invention relates to valves, and this application is a division of my application Serial No. 607,787, filed April 27, 1932, which has resulted in Patent No. 1,956,554, issued May 1, 1934.

The invention is particularly adaptable to a dual valve of a type frequently employed in refrigeration systems. Such a valve has two independent passages leading therethrough, each controlled by a separate closure member, and both passages extending side by side through a common branch which is adapted to be threaded into or otherwise put in communication with a single vessel, such as the receiver for a mechanical refrigerator, which those skilled in the art know contains both liquid and gas. In using my valve one of its passages communicates with the liquid in the lower part of the receiver through a tube brazed into the passage and the other passage is in open communication with the upper or gaseous part of the vessel or receiver.

In designing my valve it was my desire to incorporate in a compact valve body valve stems and closure members, each readily accessible, and independently operable to control the flow of fluid into and out of the said vessel or receiver, and also to provide means for joining the separate passages with separate tubes or conduits communicating with other elements in the system.

Thus it is among the objects of my invention to provide a compact and inexpensive dual valve. Another object is to arrange the passages, seats, stems and connections in the most compact yet accessible relation, so that a minimum amount of metal need be employed, a minimum waste entailed and a minimum machine work required in the production of my valve, consistent with ample strength, durability, accessibility, good appearance and safety. Another object of this invention is to combine a valve body fashioned from extruded or drawn bar stock that may be produced at a lesser cost than forgings or castings, yet will be possessed of all the qualities of a forging or casting as regards to strength, durability and efficiency.

Other objects and advantageous features of the invention will be noted in the following detailed description and accompanying drawing, wherein like characters of reference designate corresponding parts and wherein:

Figure 1 is a perspective view of a bar of extruded and drawn stock from which the blank shown in Figure 2 is severed, the blank being shown after the machining operation of forming

an extension, circular in cross section, extending at an obtuse angle to the main body;

Figure 2 is a view in perspective of the blank illustrated in Figure 1, after certain operations have been performed thereon;

Figures 3, 4, 5 and 6 are views in elevation and in section illustrating various steps in the making of the valve body;

Figure 7 is a sectional view illustrating the valve body and cooperating parts assembled therewith; and

Figure 8 is a view in section on line 8—8 of Figure 6.

In carrying out the objects of my invention and referring to the drawing, it will be seen that my novel valve comprises a pair of cylindrical portions merging into a common body having a lateral branch terminating adjacent to but offset from one of the cylindrical portions. I have evolved this design of valve having in mind both the compactness of the valve and the method by which it was to be made. Thus with this design I am able to form bar stock by such means as extruding and drawing or rolling metals, such for example, as brass having the shape illustrated in Figure 1, which comprises a pair of cylindrical, or partially cylindrical, portions merging into and oppositely offset from a rectangular portion. It will further be seen that the axes of the cylindrical portions are respectively above and below the central plane of the bar and are respectively disposed near and far from the rectangular portion of the bar. It will also be seen in Figures 1, 2 and 8 that the axes of the cylindrical portions are inclined with relation to the lateral median plane of the body of the bar.

Having formed the bar stock in the shape shown in Figure 1, as the first step of my process, I next sever the bar in a plane normal to its axis into lengths equal to the height of the valve body, as viewed in Figures 3 and 4. The blank having been so severed I remove part of the rectangular portion substantially down to a plane tangent to the centrally located cylindrical portion, leaving normal to such plane a lateral branch which is externally provided with pipe threads for attachment into the vessel, the flow to and from which is controlled by my valve. In this stage, at the end of the second step of my process, the valve has the appearance shown in Figure 2.

There remains in producing the finished exterior of the valve, the step of turning away enough stock adjacent the ends of the cylindrical portion to permit of the external threading of

these portions for reception of cap nuts 29, see Figure 7, which enclose the exposed ends of the valve stems and seal these portions of the valve against any chance of leakage along the valve stems. With the completion of the external threading of these ends of the cylindrical portions, shown at the top in Figure 3 and bottom in Figure 4, the last step of my process as to exterior formation has been taken and the valve body has thereupon assumed its finished exterior appearance.

Those skilled in the art will understand that it is not mandatory nor necessarily expedient to perform the three foregoing steps in the order named, without interrupting the sequence of steps by other operations such as drilling, boring or tapping on the inside of the valve body. I have discussed the three preceding steps to illustrate the correlation of my shape of the finished product to show how vitally and effectively dependent is the shaping of the rod or bar stock related to the contour of the finished product. It is by this cooperative relationship that I save material, time and effort as well as provide a compact and novel finished product as will more fully appear in discussing the subsequent steps of my process and the structure of the finished valve.

Passing now from the formation of the exterior of the valve, which now comprises parallel cylindrical portions 2 and 3 with their axes spaced apart and lying in a plane inclined to the axis of the branch 5, to the interior of the valve, I form parallel axial passages 15, drilled, bored, counter-bored and tapped as shown in the several figures, particularly Figure 3. The passages being preferably exactly alike, include at 17 squared shoulders forming seats for the two valves; at 16 internally threaded walls for engaging the threads 14 on the valve stem (see Figure 7) which cooperate with the valve stems 25 and 26 for the usual purpose.

The ends of the cylindrical portions 2 and 3 adjacent the packing glands are beveled and sharpened to form a seal with the cap nuts 29 as a further and ultimate protection against leakage.

Referring particularly to Figures 4 and 5, and to the upper ends of the cylindrical portions 2 and 3 as shown therein, I form in and at the ends of these passages enlarged internally raised conical seats 19 after the teaching of the Weatherhead Patent No. 1,733,925 which separately constitute the female members of tube couplings and are each adapted to receive the flared end of such as a copper tube along with the male member of such a coupling and form a fluid tight joint with said tubing.

Thus the cylindrical portions 2 and 3 each include (see Figure 7) a female member of a tube coupling, a fluid passage 15, a valve seat 17, a valve stem 25 or 26, a packing ring and gland 27 and 28 and sealing brim for the separate cap nuts. It remains to consider now to establish fluid communication between the separate passages 15 with separate passages extending through the common branch 5 in the most compact manner and one in which there is no sacrifice of utility or efficiency of manufacture.

Referring particularly to Figure 8, it will be seen that the additional passages 21 and 22 can be separately encompassed within the small confines of the branch 5 by reason of the offset and inclined relation of the axes of the cylindrical parts 2 and 3. The passages 22 and 23 are each

drilled normal to the plane of tangency to the inner cylindrical portion and parallel to the axes of the branch 5. Preferably the passage 21 has one wall substantially tangent to the passage 15 in the inner cylindrical portion 3. Preferably also the passage 22, which in this particular embodiment is larger than the passage 21, has its axis substantially tangent to the wall of the passage 15 in the cylindrical passage 2, whereby the end of the passage 2 is extended slightly beyond the center of the passage 15, as shown in Figure 8. The passages 21 and 22 have been related to each other in size and disposition within the branch 5 because of the duty imposed upon them in the particular use in which I have employed this valve, that is, the passage 21 was intended to convey liquid, as mentioned above, directly from the bottom of the vessel or receiver into which the branch 5 is threaded in fluid tight connection, while the passage 22 conveys fluid and gas to the top of such receiver. The passage 21 is counter-bored as at 23 to receive the end of a tube or conduit which may be brazed therein or otherwise sealed and lead therefrom to the bottom of the vessel mentioned above.

Referring also to Figures 5, 6 and 7, the relationship and points of contact between the passages 15, 21 and 22, can be observed from different points of view, it appearing particularly in Figure 7 that as either of the valve stems 25 or 26 are rotated so as to back the stems away from the seats 17 that fluid communication is established in one instance through one of the passages 15 and the passage 21 and in the other instance through the other of the passages 15 and the passage 22.

From the foregoing, it will appear that I have provided a novel dual or plural valve which is most compact, economical as to material cost and economical of machine work and finished operations in its manufacture. It will also appear that my novel design and arrangement of the several valves proper, including the seats and stems disposed as they are, in a plane which is inclined to the axes of the common branch and being severally offset from the axis of the branch and spaced near and far therefrom respectively, provides an arrangement which results in a neat and compact article of manufacture and lends itself to the method of manufacture from extruded and drawn or rolled bar stock claimed in my application, Serial No. 607,787, now Patent No. 1,956,554.

While the foregoing has constituted a description of a preferred embodiment of my invention, I appreciate that modifications and changes all within the scope of the major precepts thereof may occur to those skilled in the art and I do not limit myself to the specific embodiment disclosed herein or in any manner other than by the claims appended hereto.

I claim:

1. A multiple valve body having a plurality of valve stem and closure embracing cylindrical portions merging into the body thereof each having an axial longitudinal passage communicating with external agencies, said valve having a laterally disposed connector part also for communicating with external agencies with its axis extending substantially perpendicular to the axes of said cylindrical portions and intersecting the plane of at least two of the axes of said cylindrical portions between said axes and at an acute angle thereto, said body and connector having

spaced lateral passages extending parallel to the axis of said connector and communicating with and substantially tangent to the said longitudinal passages in said cylindrical portions.

5 2. A multiple valve comprising a body having two parallel cylindrical portions provided with axial passageways, valve seats formed in said passageways and valve stems threaded into said passageways, and a transversely extending

threaded cylindrical projection, said parallel cylindrical portions being unequally spaced from the end of said cylindrical projection, said cylindrical projection having a pair of parallel fluid conducting passages therein terminating in substantially the same plane extending from the end of said cylindrical projection to said first-named passageways. 5

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