Aug. 3, 1948. H. E. TAUTZ 2,446,496

METHOD OF MAKING GAS COCKS

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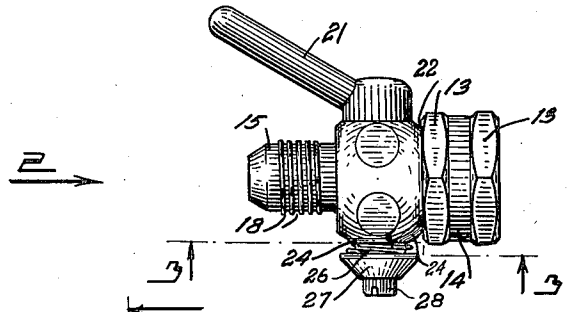

Fig. 1.

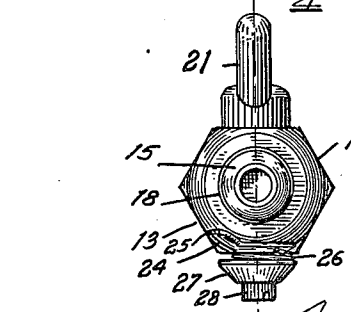

Fig. 2.

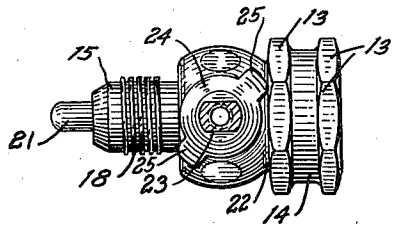

Fig. 3.

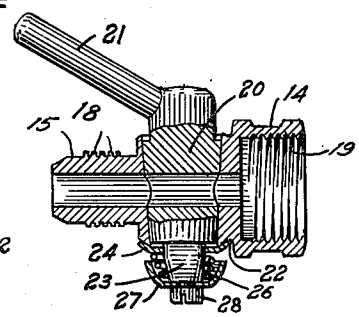

Fig. 4.

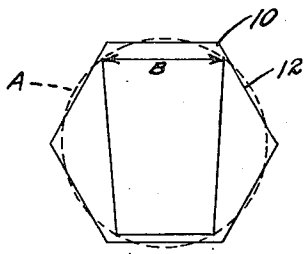

Fig. 6.

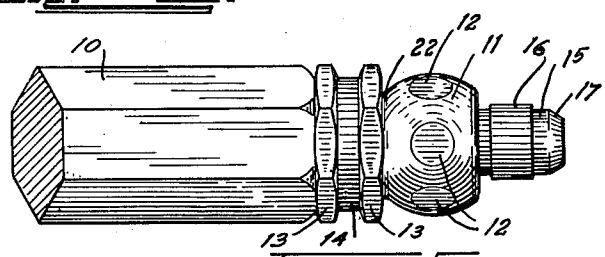

Fig. 5.

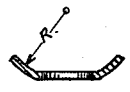

Fig. 7.

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METHOD OF MAKING GAS COCKS

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3 Claims. (Cl. 29—157)

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This invention relates to a gas valve and more particularly to a method for manufacturing gas valves.

The principal object of the invention is to provide a gas valve which can be economically manufactured as a screw machine product.

There are certain standards which must be met in all gas valves, for instance, in order to meet the sealing area requirements for a ¼" gas valve a spherical housing one and one-sixteenth inches in diameter has been found necessary. To obtain this diameter from a hexagonal bar on a screw machine it would be customary to use a bar equaling or exceeding one and one-sixteenth inches. Another object of this invention is to provide a valve construction which can be manufactured as a screw machine product from a 1" hexagonal bar and still obtain the necessary one and one-sixteenth inch spherical housing.

It is necessary in gas valves of the taper-plug type to provide some means of stopping the valve in the closed and in the open position. This is usually accomplished by insetting a pin or stud into the valve body, which is contacted by a washer-ear to stop rotation of the valve or by milling a sector-shaped socket around the stem in which a pin or other projection on the valve stem rides. Neither of these forms are adaptable to screw machine production, since the drilling and insetting of the pin, or the cutting of the sector-shaped indentation requires separate operations.

The further object of this invention is to provide means for stopping rotation of the valve plug in both the open and the closed positions which will require no additional steps in manufacture.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention, reference is had to the accompanying drawing which forms a part hereof. Like numerals refer to like parts in all views of the drawing and throughout the description.

In the drawing:

Fig. 1 is a side elevational view of a gas valve produced by this improved process;

Fig. 2 is an end view thereof, looking in the direction of the arrow 2, Fig. 1;

Fig. 3 is a horizontal section looking upwardly on the line 3—3, Fig. 1;

Fig. 4 is a longitudinal section taken on the line 4—4.

Fig. 5 is a detail view illustrating a step in the manufacture of the improved valve from hexagonal bar stock;

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Fig. 6 is a diagram illustrating the relation of the improved gas valve to hexagonal bar stock from which it is manufactured;

Fig. 7 is a detail section through a stop washer used on the improved valve.

The valve and the method of manufacture will be described as relating to a ¼" gas valve. It is to be understood, however, that the same method and the same construction will apply to gas valves of any size.

The usual ¼" gas cock or gas valve is manufactured from cast material, the body being cast slightly larger than one and one-sixteenth inches in diameter. In order to manufacture such a valve from bar stock in a screw machine it would be standard practice to use stock of one and one-sixteenth inches in diameter. With this improved valve and method, however, a one inch hexagonal bar 10 is used, as illustrated diagrammatically in Fig. 6. The body of the valve, illustrated at 11 and indicated by the broken line A, is turned, however, to a spherical diameter of one and one-sixteenth inches. This greater diameter of course causes the body to project beyond the flat sides of the hexagonal bar as indicated in Fig. 6.

At the points where the spherical contour of the body 11 cuts through the flat surfaces of the hexagonal bar 10, circular flat facets 12 will be formed. These facets 12 interfere in no way with the sealing capacity of the valve and add to its ornamental appearance and enable the manufacturer to use a 1" bar instead of the usual one and one-sixteenth inches, thereby attaining a great saving in material.

The bar 10 is turned in the screw machine, as shown in Fig. 5, to form two series of spaced apart, hexagonal wrench faces 13. The wrench faces 13 are the normal hexagonal faces of the bar 10 separated by a cylindrical band 14. This eliminates all milling operations for forming the wrench faces. The extremity of the bar is turned down to form a nipple portion 15 having thread stock 16 thereon. The extreme extremity is tapered to form a taper-seat 17.

Thus the entire body with all its appurtenances is turned directly and simultaneously from the bar 10, after which the turned portion is cut away to continue through the screw machine.

In its travel through the screw machine, male threads 18 are formed on the nipple portion 15 and female threads 19 are formed within cylindrical portion 14 and the body is drilled axially. The body 11 is also drilled diametrically, using the

centers of two opposite facets 12 as the axis. This diametric drilled hole is then tapered to receive a tapered valve plug 20.

The head of the plug valve 20 is drilled on an angle to receive a handle 21, which is forced into the angularly drilled hole therein.

The standardized rules require the plug valve 20 to have a diameter of 5/8" at its upper extremity. This has always been thought impossible with a 1" hexagonal bar, due to the fact, that the six faces of the bar have a width of only 7/8". By setting the plug valve 20 sufficiently far down in the taper bore, however, it was found possible to obtain a width of 5/8" at the top as indicated by the line B, Fig. 6, without increasing the size of the bar 10, therefore the standards are met with a great saving of material.

In turning the spherical body 11 adjacent the hexagonal wrench face portion 14 a relatively deep V-shaped notch 22 is naturally formed at the intersection of the sphere with the transverse plane of the wrench face portion. This notch which is a natural result of the method of manufacture is employed in this improved valve for stopping the valve plug 20 in the opened and closed positions.

This is accomplished by forming a flat sided stem 23 on the lower extremity of the valve 20. A spherically indented stop washer 24 is fitted over the stem 23 so as to rotate therewith. The washer is provided with two oppositely positioned spherically indented ears 25. The spherical indentation in the washer 24 corresponds in radius to the radius of the sphere of the body 11 as indicated at R, Fig. 7. This correspondence in curvature causes the washer to lie flat against the spherical surface of the sphere of the body 11.

The washer 24 is held in tight contact with the body surface by means of a compression spring 26, which is clamped between the stop washer 24 and a cap washer 27 by means of a clamp screw 28 tapped into the end of the stem 23.

When the valve is in the open position of Fig. 3 one of the ears 25 will move into the V-shaped notch 22 and contact the side of the wrench portion 15 to stop and align the valve in the open position. When the valve is rotated to the closed position, that is at right angles to the position of Fig. 3, the other ear 25 will slide around the surface of the sphere into the V-shaped notch 22 to stop further rotation. Thus, it will be seen that a stop is provided which requires no additional manufacturing steps on the valve.

While a specific form of the improvement has been described and illustrated herein, it is desired to be understood that the same may be varied, within the scope of the appended claims, without departing from the spirit of the invention.

Having thus described the invention, what is claimed and desired secured by Letters Patent is:

1. A method of manufacturing a gas valve having a spherical body and a hexagonal wrench-engaging portion, said spherical body having a larger diameter than the hexagonal wrench-engaging portion including: turning said spherical body from a hexagonal bar of the size and contour of said wrench-engaging portion, the diameter of the sphere exceeding the distance between opposite faces on said bar so that said faces will form six flat facets on said sphere; turning a male thread receiving portion at one side of said sphere; then cutting said sphere from said bar at a point spaced from said sphere so that a portion of the hexagonal bar will remain attached to said sphere to form a wrench-engaging portion thereon.

2. A method of manufacturing a gas valve having a spherical body and a hexagonal wrench-engaging portion, said spherical body having a larger diameter than the hexagonal wrench engaging portion including: turning said spherical body from a hexagonal bar of the size and contour of said wrench-engaging portion, the diameter of the sphere exceeding the distance between opposite faces on said bar so that said faces will form six flat facets on said sphere; turning a male thread receiving portion at one side of said sphere; cutting said sphere from said bar at a point spaced from said sphere so that a portion of the hexagonal bar will remain attached to said sphere to form a wrench-engaging portion thereon; then drilling said sphere diametrically using the centers of two opposite facets as an axis to receive a valve member.

3. A method of manufacturing a gas valve having a spherical body and a hexagonal wrench-engaging portion, said spherical body having a larger diameter than the hexagonal wrench engaging portion including: turning said spherical body from a hexagonal bar of the size and contour of said wrench-engaging portion, the diameter of the sphere exceeding the distance between opposite faces on said bar so that said faces will form six flat facets on said sphere; turning a male thread receiving portion at one side of said sphere; cutting said sphere from said bar at a point spaced from said sphere so that a portion of the hexagonal bar will remain attached to said sphere to form a wrench-engaging portion thereon; drilling said sphere diametrically using the centers of two opposite facets as an axis; placing a rotatable valve member in the drilled hole; indenting a washer having oppositely projecting ears to a spherical contour corresponding to the spherical contour of said sphere; then placing said washer on said valve member with the spherical concavity therein engaging the surface of said sphere so that the ears on said washer will alternately engage the sides of said wrench-engaging portion.

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