

July 22, 1941.

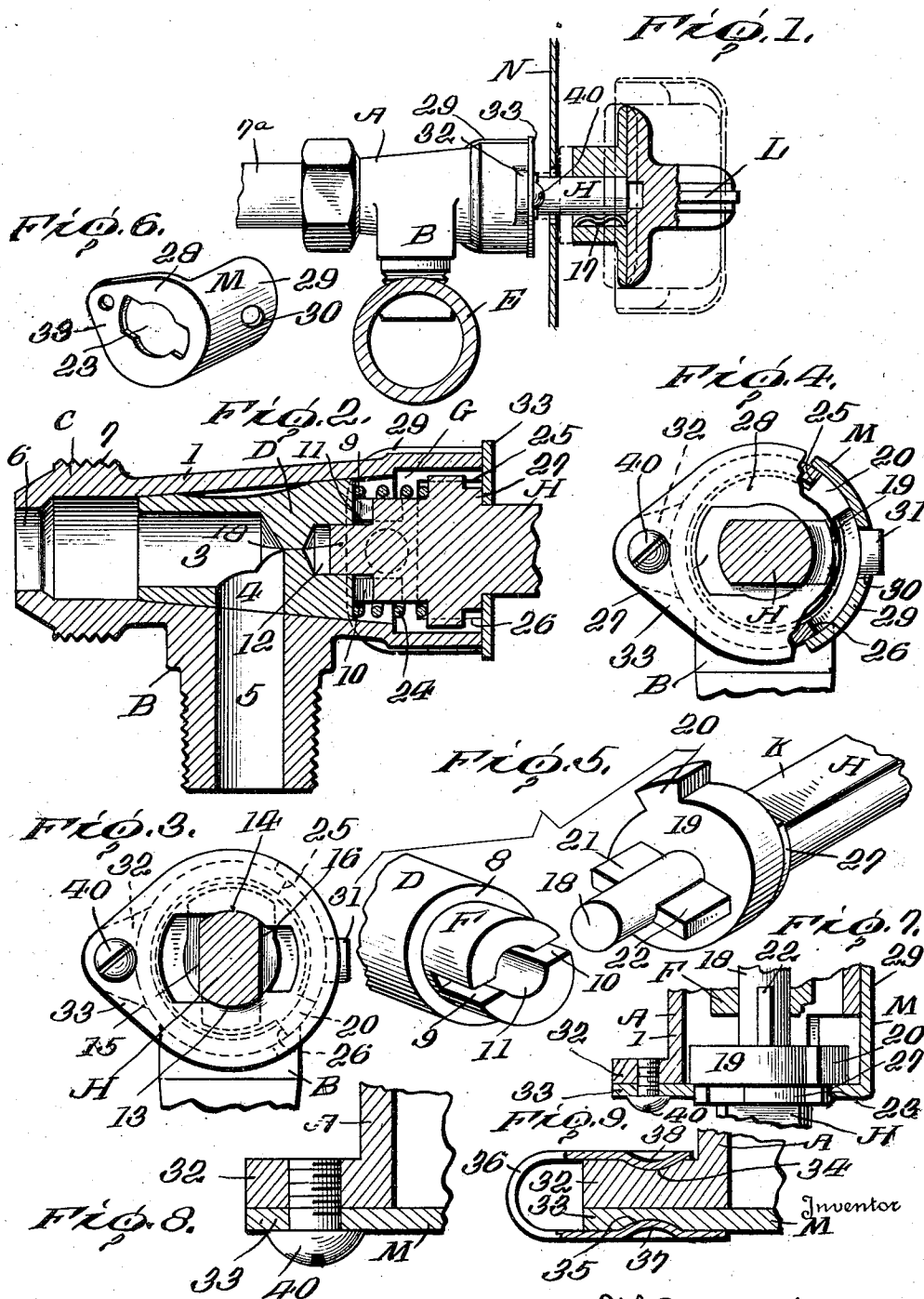
I. V. BRUMBAUGH

2,250,356

GAS COCK

Filed Feb. 3, 1938

2 Sheets-Sheet 1



I. V. Brumbaugh

By *Pattison, Wright & Pattison* Attorneys

July 22, 1941.

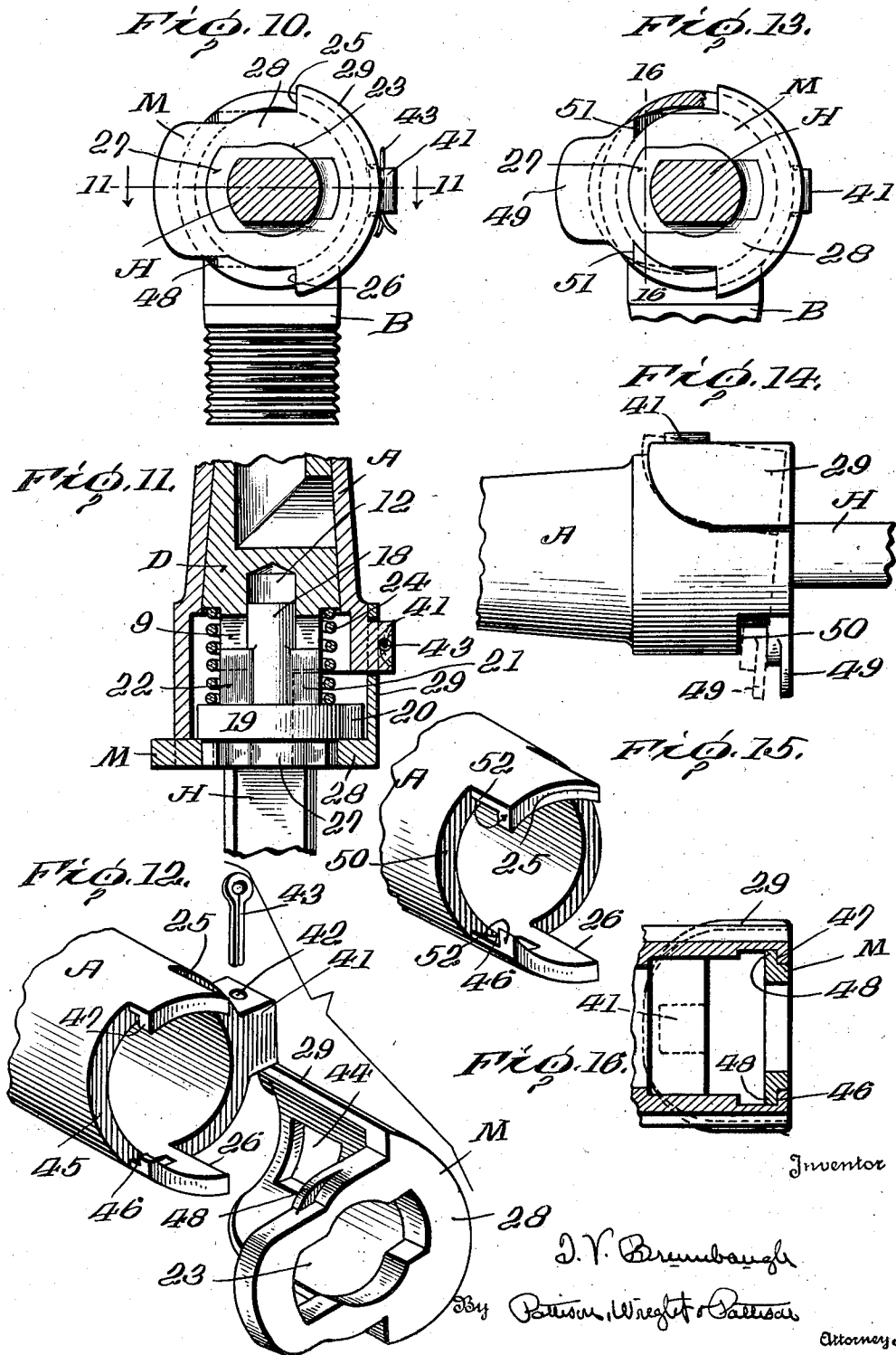
I. V. BRUMBAUGH

2,250,356

GAS COCK

Filed Feb. 3, 1938

2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE

2,250,356

GAS COCK

Isaac Vernon Brumbaugh, St. Louis, Mo., assignor
to American Stove Company, St. Louis, Mo., a
corporation of New Jersey

Application February 3, 1938, Serial No. 188,549

17 Claims. (Cl. 251-165)

This invention relates to improvements in gas cocks and pertains more particularly and specifically to a safety gas cock in that means is provided for definitely preventing accidental movement of the cock to an open position.

The present cock or valve is particularly adapted for use in connection with the control of gas to the oven burner of a gas cooking range, but it will be evident to those skilled in the art that the valve can be used for the control of liquids or gases of different kinds and for the control of many things other than the delivery of gas to an oven burner.

The primary object of the invention is the provision of a safety gas cock which is simple and cheap of construction yet highly efficient in operation and strong and durable under the uses to which it will be normally subjected.

Another and further object of the invention is the provision of a gas cock having a safety locking arrangement which is extremely simple yet positive in operation.

A still further object of the invention is the provision of a novel and improved combined closure cap and valve stem lock for the cock or valve.

Another and further object of the invention is the provision of a quickly detachable closure cap for the valve housing.

A still further object of the invention is the provision of a gas cock which is automatically self-locking.

Another and further object of the invention is the provision of a quickly detachable closure cap for the valve housing which requires no tools in the application or removal of the cap from the valve and which is so constructed as to prevent accidental displacement or removal.

A still further object of the invention is the provision of a one-piece cap of a construction whereby the cap can be made by die-casting and thus produced rapidly and cheaply.

Another and still further object of the invention is the provision of a gas cock of the rotary plug type provided with a stop means to limit its rotative movement and provided with an automatically operating lock means for locking the plug against any rotative movement and in which the stop means and locking means are not associated one with the other in their operative functions and in which the stop means cooperates with the valve housing and the lock means cooperates with an improved valve housing cap.

In the drawings:

Fig. 1 is a view in side elevation of the im-

proved cock, a portion of the cock operating handle being illustrated in vertical section.

Fig. 2 is a longitudinal vertical sectional view through the cock, the cock being in an open position.

Fig. 3 is an end view of the cock, the cock being in an open position.

Fig. 4 is an end view of the cock with a portion of the parts being broken away and illustrated in section, the cock being in a closed position.

Fig. 5 is a strung-out perspective view illustrating the cooperating end portions of the cock plug and operating stem.

Fig. 6 is a perspective view of the cap.

Fig. 7 is a fragmentary vertical sectional view illustrating the locking cooperation between the cock stem and the cap.

Fig. 8 is a fragmentary detail view in section illustrating the manner of securing the cap to the valve housing.

Fig. 9 is a detailed fragmentary sectional view illustrating a modified form of securing a cap to the valve housing.

Fig. 10 is an end view of the cock illustrating a modified form of closure cap applied thereto with the cock in a closed position.

Fig. 11 is a transverse sectional view taken on the line 11-11 of Fig. 10.

Fig. 12 is a fragmentary detail perspective view of the construction appearing in Fig. 10 with the parts arranged in strung-out or separated relationship.

Fig. 13 is an end view, partially in section, illustrating a still further modified form of cap for the cock, the cock being illustrated in a closed position.

Fig. 14 is a fragmentary view in side elevation of the construction appearing in Fig. 13.

Fig. 15 is a perspective view of one end of the valve housing of the construction illustrated in Figs. 13 and 14 of the drawings.

Fig. 16 is a fragmentary view in vertical section taken on the line 16-16 of Fig. 13 of the drawings.

Referring to and describing that form of the cock appearing in Figs. 1 to 8 inclusive, A designates a fitting or housing provided with an inlet B positioned at right angles to the main body and an outlet C which is axially aligned with the main tubular body portion A. The tubular body portion or housing A is hollow and is provided with a tapered bore 1 within which is rotatably disposed a tapered cock or valve plug D having therein a passageway made up of the communi-

cating bores 3 and 4 which when the plug is in an open position communicate with the inlet bore 5 and the outlet opening 6 of the housing, as clearly appears in Fig. 2 of the drawings.

The outlet end of the housing is externally threaded as at 7 to receive a pipe 7^a for delivering gas to the oven burner (not shown) as it passes from the source of supply through the cock. In Fig. 1 of the drawings a supply conduit E is illustrated as being in communication with the lower end of the housing inlet B.

The large end of the tapered cock plug D is reduced, see Fig. 5 of the drawings, as at 8 to provide a reduced extending tubular portion F which is slotted as at 9 and 10 and centrally bored as at 11 which bore extends into the enlarged end of the valve plug, as clearly appears at 12 in Fig. 2 of the drawings.

The main tubular portion of the cock housing A extends beyond the large end of the cock plug to provide a chamber G, as clearly illustrated in Fig. 2 of the drawings.

The cock or valve operating stem is designated as an entirety by H and comprises a reduced elongated stem portion K which is of peculiar cross sectional configuration in that it has opposite rounded sides 13 and 14 and opposite flat sides 15 and 16, see Fig. 3 of the drawings. The flat side 15 is of greater depth than the flat side 16 with the result that the valve operating handle L can only be placed upon the elongated stem in a correct position due to the fact that the opening within the valve operating handle is of a similar configuration to the cross sectional shape of the reduced elongated valve stem portion K. A spring 17 is positioned within the opening in the cock operating handle which receives the stem and the construction permits the operating handle to be quickly attached to and detached from the operating stem yet the frictional engagement between the parts due to the spring is sufficient to prevent accidental displacement of the handle from the stem.

Referring again to the operating stem H and particularly Fig. 5 of the drawings, it will be seen that the inner end of the stem 18 is of tubular form and at its inner end terminates in a disc-like member 19 on the outer peripheral edge of which is provided an outwardly extending lug 20. Between its outer end and its inner end the tubular shaft-like portion 18 is provided with a cross arm which provides oppositely disposed wing-like members 21 and 22 at the opposite sides of this tubular shaft portion.

At its opposite side and adjacent the inner end of the stem portion K the disc 19 is provided with a raised face 27 having a configuration similar to the opening 23, see Fig. 6 of the drawings, in the cap M. This raised face can well be termed the locking face of the operating stem in that this face cooperates with the cap, in a manner hereinafter to be described, to positively lock the stem against rotation.

When the parts are in their assembled relationship as illustrated in Fig. 2 of the drawings the operating stem shaft portion 18 extends in the bore 11 of the reduced end portion F of the plug D and into the bore 12 of the large end of the plug. The wing-like members 21 and 22 are disposed within the slots 9 and 10 of the plug extension F. A coil spring 24 surrounds the reduced end portion F of the plug D and bears at one end against the enlarged end of the plug and at its other end against the inner face of the disc-like member 19. All of these parts are dis-

posed within the chamber G at the large end of the valve housing or fitting A. The outer wall of this housing is provided with a segmental cut-out portion which extends, see Fig. 3 of the drawings, from the point 25 to the point 26. The lock or stop member 20 of the plug operating shaft moves in this segmental cut-out portion to permit a ninety degree rotation of the plug which is the rotation necessary to move the plug from a fully open to a fully closed position, or vice versa.

In assembling the parts in the manner thus far described end pressure is applied to the operating shaft but attention is directed to the fact that due to the engagement of the stop lug 20 with the lower face of the segmental cut-out portion of the valve housing it is impossible to apply pressure to such an extent as to cause any binding between the tapered plug D and its tapered seat.

With the parts compressed and assuming the positions illustrated in Fig. 2 of the drawings the cap M is then placed upon the valve housing. This cap closes the outer end of the housing, holds the parts in place against the tension or action of the spring 24 and additionally cooperates with the raised face 27 of the operating stem disc 19 to lock the valve against rotation, as will now be explained.

The cap M comprises a face portion 28 having therein the opening 23 of the particular configuration heretofore referred to. Extending from one side of the face 28 of the cap and at right angles thereto is a skirt portion 29 having adjacent its lower edge an opening or aperture 30. The valve housing A is provided with an outwardly extending pin 31 at one side of its body. At the opposite side of the valve body or housing and at its end the housing is provided with an outwardly extending ear 32, see Fig. 8 of the drawings, and the cap M is provided with a similar ear 33.

As will be clearly apparent from the drawings the cap M is positioned on the enlarged end of the housing A in a manner whereby the housing pin 31 extends through the skirt opening 30 of the cap with the ear of the cap and the ear of the body in superposed relationship. A screw 40 secures these ears together and the cap against displacement.

It is thought that the operation of the device will be obvious. The coil spring 24 tends at all times to not only hold the tapered plug in leak-proof relationship with its tapered seat but tends also to force the valve operating stem away from the valve plug. The connection between the operating stem and the plug is such as to permit axial movement of the stem in respect to the plug but at the same time assure rotative driving connection between the stem and the plug. When however the raised locking face 27 of the stem disc 19 is moved into proper registry with the opening 23 in the cap M this face will pass outwardly through the opening in the cap, as is clearly illustrated in Fig. 7 of the drawings, and will as a consequence lock the operating stem against rotation. When the parts are in this locked position the valve plug has assumed a position to close the cock to the passage of fuel or liquid therethrough. To open the cock or valve it is necessary to press inwardly upon the operating handle L and move the stop face 27 into a plane below the plane of the under side of the cap M and thereafter rotate the stem by rotation of the operating handle. Upon inward

movement of the stem the valve plug can be rotated to an open position and will remain in an open position but will not be locked in that position because the outer face of the raised portion 27 is riding or sliding upon the under face of the cap.

The valve is moved from an open position to a closed position by rotating the operating stem in a counter-clockwise direction and when the stop face 27 comes into proper registry with the opening 23 in the cap, which will occur when the valve reaches a closed position, the stem will automatically move outwardly under the action of the spring 24 and cause the valve to be locked in its closed position.

Referring to Fig. 9 of the drawings it will be seen that a U-shaped spring 36 resiliently and quickly detachably secures the ear of the cap and the ear of the body together. The arms of the U-shaped spring are provided with depressed portions 37 and 38 which due to the resilient nature of the spring seat within the depressions 34 and 35 in the valve body ear and cap ear respectively.

Figs. 10 to 12 inclusive are illustrative of a modified form of cap and the description is therefore limited to the cap per se and its cooperative relationship to the end of the cock or housing A.

In the form of the invention here illustrated the housing is provided with an outwardly extending pin or lug 41 which in this instance is illustrated as being square although it could be round and work equally as effectively. This lug or pin is provided with a transverse bore or opening 42 adapted to receive a cotter key 43. The cap M is provided with the same face 23 and the skirt portion 29. The skirt portion is provided with an opening 44 of the proper configuration to receive the lug or pin 41. The face 23 is provided with the same heretofore referred to opening 23 to receive and lock with the lock face 27 of the valve operating stem. The segmental cut-out portion of the valve housing or barrel A and within which moves the stop lug 20, is designated as being between the vertical walls 25 and 26. At the opposite side of the housing A it is cut-out as illustrated at 45, see Fig. 12 of the drawings, and is under-cut as illustrated at 46 and 47. The depth of the cut-out portion 45 coincides with the thickness of the cap face 23.

At its edges the cap is milled to provide oppositely disposed wing-like extensions 48.

Fig. 10 clearly illustrates the cap in locked position upon the valve housing. From this figure of the drawings it will be seen that the cap has first been placed over or threaded upon the operating stem H and then slid to the left or across the end of the valve housing thus bringing the skirt opening 44 into registry with the lug 41 which lug has passed through the skirt while at the same time the wing-like extension members 48 have entered the under-cuts 46 and 47. The cotter key 43 has been passed through the opening 42 provided in the housing lug 41.

The engagement of the wing-like portions of the cap with the under-cuts of the valve housing prevent movement of the cap in respect to the housing in an axial direction while the cotter key prevents movement of the cap in the opposite direction. It will thus be evident that the cap is securely locked in position to hold the operating parts of the valve or cock in proper cooperative relationship but that the cap is capable of being quickly and easily removed from the housing.

Figs. 13 to 16 inclusive illustrate a still further modified form of securing the cap to the valve housing and differs from the previously described construction appearing in Figs. 10 to 12 inclusive only in the elimination of the use of the cotter key to prevent the movement of the cap in a direction transverse the axis of the valve housing and valve operating stem.

In this form of the drawings similar parts are designated by similar reference numerals.

In this instance in applying and removing the cap it is necessary to depress the end 49 of the cap face 23 in the manner illustrated by dotted lines in Fig. 14 of the drawings. To make provision for this additional movement of the cap the valve housing A is provided with a quite deep segmental cut-out portion 50. The end of the housing A adjacent this segmental cut-out portion is under-cut, as illustrated at 46 in the manner heretofore described in connection with the other form of the invention and the cap at its edges is provided with the same or similar wing-like extensions 48 heretofore referred to in the other form of the invention, but in this instance the cap edges are provided with shoulders 51 which provide abutments at the forward ends of these wings.

In applying the cap it is threaded upon the operating stem and then slid in a transverse direction across the end of the valve housing in the manner illustrated in Fig. 14 of the drawings where it will be seen that the end 49 of the cap is slightly depressed. This transverse movement of the cap will thread the lug 41 in the opening provided in the cap skirt 29. The end 49 of the cap is then allowed to raise under the action of the spring 24 with the result that the cap will assume the position illustrated in Fig. 13 of the drawings with the shoulders 51 in abutment with the front edges 52, see Fig. 15 of the drawings, of the cap housing. Engagement of these shoulders with the cap housing will prevent movement of the cap in a direction transverse the housing while the wing-like portions 48 and the lug 41 will prevent any possibility of outward movement of the cap in a direction axial of the housing or of the valve operating stem.

I claim:

1. In combination, a cock and a cap therefor, said cock having a body provided at one side of one of its ends with an outwardly extending ear-like portion and at its opposite side with an outwardly extending lug, said cap having a face portion including an ear-like extension adapted to abut the end of the body and the body ear, said cap having a skirt-like portion adapted to parallel the outer side of the body and provided with an opening adapted to receive said body lug, and means to secure the ear-like portion of the cap and body together.

2. In combination, a cock and a quick detachable cap for one end thereof, said cock comprising a body having in one end thereof a cut-out portion in its side wall, grooves in the side wall of said body adjacent the cut-out portion thereof, an outwardly extending lug positioned at that side of the body opposite the cut-out portion thereof and disposed at a point inward of the end of the body, a cap having a face plate including a reduced portion adapted to slide into the cut-out portion of the body end, wing-like extensions at the opposite sides of said face plate and adapted to enter and interlock with said grooves to prevent displacement of the cap in a direction longitudinal of the cock body, said cap provided

with a depending skirt provided with an opening adapted to receive the outwardly extending lug of the cock body, the parts operating as and for the purpose described.

3. In combination, a cock and a quick detachable combined cap and locking plate, said cock comprising a body having a rotatable valve plug therein and an operating stem therefor, said cap comprising a face plate having an opening adapted for locking connection with the stem of said valve plug, said plate having at its opposite edges milled-out portions terminating in shoulders and a depending skirt provided with an opening, said body provided with a cut-out portion terminating in under cut shoulders to provide therein grooves, the milled portion of the plate adapted to seat within the grooves of the body and the shoulders of the milled portion of the plate adapted to abut the shoulders of the cut-out portion of the body, and the body further provided with an outwardly extending lug adapted to pass through the opening in the cap skirt, whereby the combined cap and locking plate is locked to the body against displacement therefrom but is quickly removable by manual manipulation.

4. For use with a cock, comprising a body having at one side thereof short of its end an outwardly extending lug and at its end an outwardly extending ear, a cover for the end of the body, said cover having a face and a depending skirt, the face of said cover provided with an ear-like portion adapted to be positioned in superimposed relationship upon the ear of the body and the skirt provided with an opening adapted to telescopically receive the lug of the body, and means for clamping the cover and body ears together and acting to prevent displacement of the skirt opening from the body lug.

5. In combination, an improved cock and a cap therefor, said cock including a body provided at one of its sides and adjacent one of its ends with an outwardly extending lug, said cap having a face portion secured to said end of said cock body and provided with a skirt-like portion adapted to parallel the outer side of said cock body, and said cap skirt provided with an opening adapted to receive and interlock with the lug at the side of said cock body.

6. In combination, a cock and a cap therefor, said cock including a body having an open end and provided on its side wall adjacent said end with an outwardly extending lug, said cap having a face portion secured on the open end of said cock body and provided with an extending portion having a part adapted to be positioned behind said lug to prevent longitudinal displacement of said cap from the open end of said cock body.

7. In combination, a cock and a cap therefor, said cock including a body having an open end and provided on its outer side wall adjacent said end with an outwardly extending lug, said cap having a face portion secured to the open end of said body and provided with an extending portion, and said cap extending portion provided with means adapted to interlock with said cock body lug to prevent longitudinal displacement of said cap from said cock end.

8. In combination, a cock and a cap therefor, said cock including a body having an open end provided at one of its sides adjacent said end with an outwardly extending lug, said cap having a face portion having sliding interlocking connection with the open end of said cock body, and said cap provided with an extension portion

adapted when said cap face is slid into interlocking relation with said cock body to be positioned parallel with the outer side of said cock body, and said cap extension portion provided with means adapted to interlock with said lug to prevent longitudinal displacement of said cap from the open end of said cock body.

9. In combination, a cock and a cap therefor, said cock including a body having an open end and provided at one of its sides adjacent said end with an outwardly extending lug, said cap having a face portion adapted to abut and be secured to the outer end of the wall which defines the end opening of said cock body, and said cap having an extension portion provided with means adapted to interlock with said body lug to prevent longitudinal displacement of said cap from said body end.

10. In combination, a cock and a quick detachable cap for one end thereof, said cock comprising a body having an open end one wall of which is provided with a cut-out portion, a lug extending outwardly from said cock body at a point inward of the end of said body and approximately oppositely disposed to said cut-out portion, a cap having a face plate and an extending portion at right angles thereto, the face plate of said cap having sliding interlocking engagement with the walls of said cock body at each side of the cut-out portion thereof, and said cap extension provided with means adapted to interlock with said lug and prevent longitudinal displacement of said cap from said cock body end when said cap is slid into interlocking relationship with said cock body as described.

11. In combination, a cock and a quick detachable cap for one end thereof, said cap comprising a face portion and an extension disposed at substantially right angles thereto, said cock comprising a body having in one end thereof oppositely disposed cut-out portions to provide between them body side walls constituting tongue-like extensions beyond the end of said cock body, said cap face adapted to be slid transversely of said cock body through said oppositely disposed cut-out portions and having sliding interlocking connection with the tongue-like side wall extensions of said body, an outwardly extending lug on the side wall of said body adjacent one of the cut-out portions thereof, and said cap extension provided with means adapted to interlock with said lug in a manner to prevent longitudinal displacement of said cap from said cock body end.

12. In combination, a cock having an open end and a cap closure therefor, the side walls of said cock at the open end thereof being oppositely cut away to provide oppositely positioned and outwardly extending side wall portions, said cap having a face portion and a depending skirt-like portion provided with an opening, an outwardly extending lug on the side wall of said cock adjacent one of the cut-out portions thereof, said cap being adapted to be slid across the open end of said cock through said side wall cut-out portions and between said outwardly extending side wall portions until its skirt opening receives said cock lug, and means providing slidable interlocking connection between the face portion of said cap and said outwardly extending side wall portions which are disposed intermediate the cut-out portions of the cock.

13. In combination, a cock and a quick detachable cap for one end thereof, said cock comprising a body having an open end and provided

on its outer side wall adjacent said end with an outwardly extending lug, said cap having a face portion and an extending portion disposed substantially at right angles to said face portion, means providing sliding interlocking connection between said cap face and the open end of said cock body upon application of said cap to said cock end by a transverse sliding movement, and said cap extension having interlocking connection with said body lug when said cap face is interlocked with said cock body end as described.

14. In combination, a cock and a cap therefor, said cock comprising a body with an open end, the side walls of the open end of said body being oppositely cut-out to provide a pair of extending lip-like side wall portions provided with oppositely disposed grooves which extend transverse said lips, said grooves extending from one edge of said lip portions and stopping short of the other edge thereof and terminating in shoulders, said cap comprising a face portion and an extension portion substantially at right angles thereto, said face portion provided with oppositely outwardly extending wings terminating in shoulders, said wings adapted to engage said grooves and prevent displacement of said cap longitudinally from said cock body, the shoulders of said wings and the shoulders of said grooves adapted to abut and prevent movement of said cap transverse said cock body in one direction, said cap extension adapted to engage the side wall of said cock body and prevent movement of said cap transverse said cock body in the opposite direction, resilient means within said cock body normally urging the wings of said cap into abutting relationship with said aforementioned grooves, and the cut-out portions in the walls of the open end of said cock

body and the grooves in the lip-like extension portions of said wall being of sufficient depth to permit the face portion of said cap to be depressed against the tension of said resilient means a distance sufficient to disengage the shoulders of said cap wings and the shoulders of said grooves and thereby permit the removal of said cap from said cock body in a transverse direction to said body.

15. A construction such as defined in claim 14, wherein a lug extends outwardly from said cock body adjacent its open end, and the extension portion of said cap is provided with means which interlocks with said lug when said cap is applied to the open end of said cock body, said connection being such as to assist in preventing displacement of said cap in a longitudinal direction from the open end of said cock body.

16. The combination of a hollow body having its front and rear ends open, a valve within and extending longitudinal the body, a quick detachable cap for the rear end of said body and connected therewith by a sliding interlocking movement transverse said body, and means separate and distinct from said sliding interlocking connection for locking and preventing a movement of said cap in a direction longitudinal the axis of said body and said valve.

17. In combination, an improved cock and cap therefor, said cock including a body provided at one of its sides and adjacent one of its ends with an outwardly extending lug, said cap provided with a skirt-like portion paralleling the outer side of said cock body, and said skirt provided with an opening adapted to receive said lug thereby holding said cap in position on said body portion.

ISAAC VERNON BRUMBAUGH.