Feb. 14, 1939. C. C. FARMER 2,147,287

SELF-LOCKING ANGLE COCK

Filed Jan. 9, 1936 2 Sheets-Sheet 1

Fig. 1

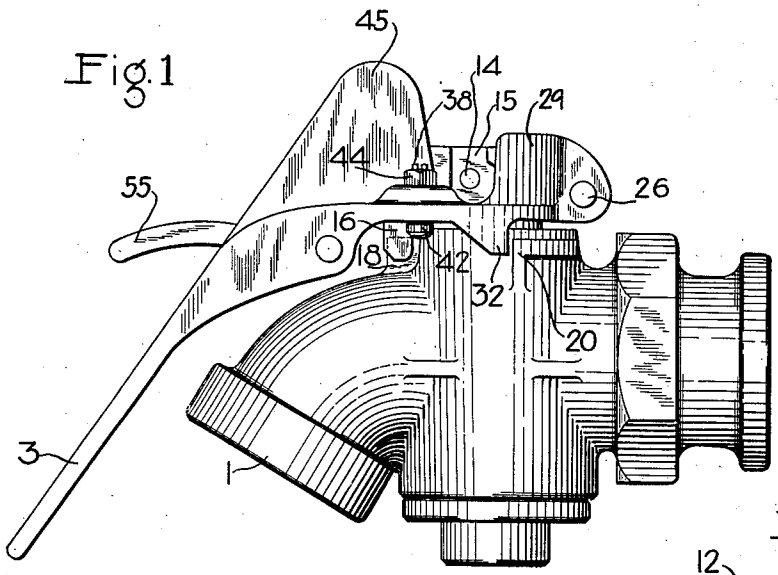


Fig. 4

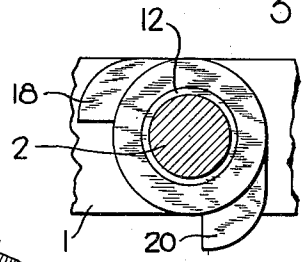


Fig. 2

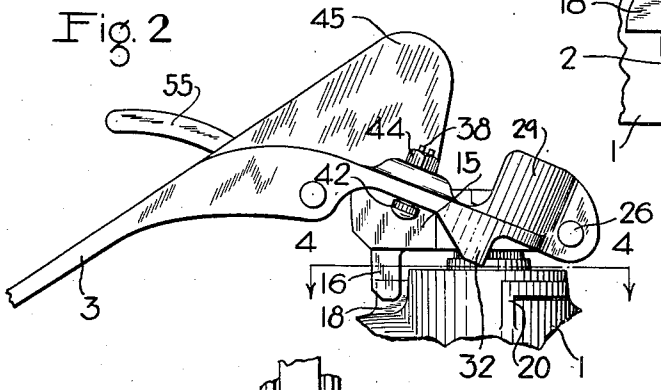
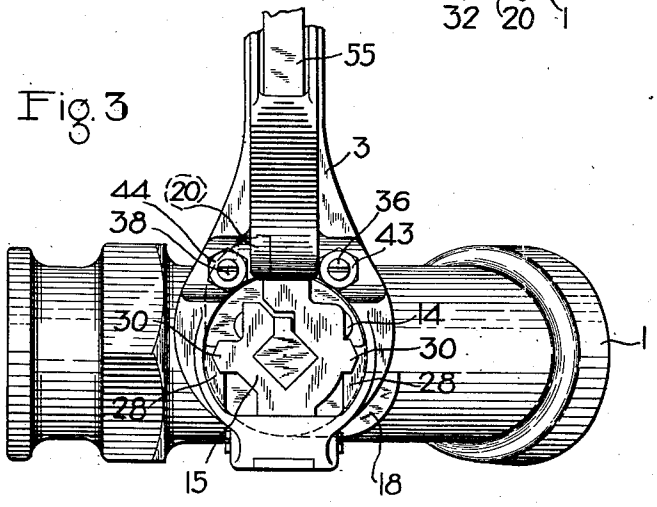


Fig. 3



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Fig. 7

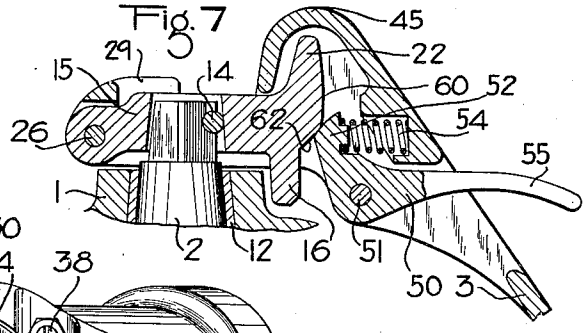


Fig. 5

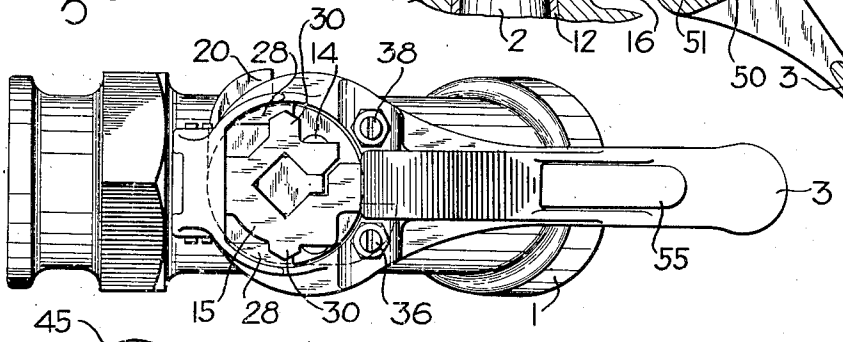


Fig. 8

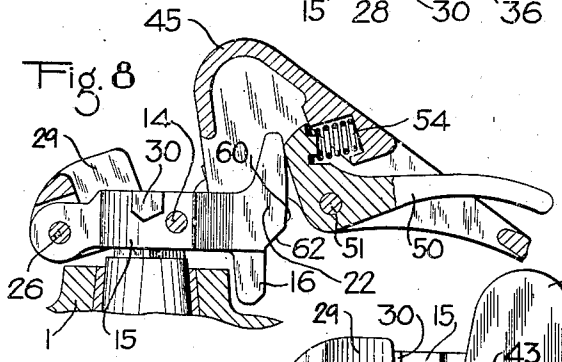
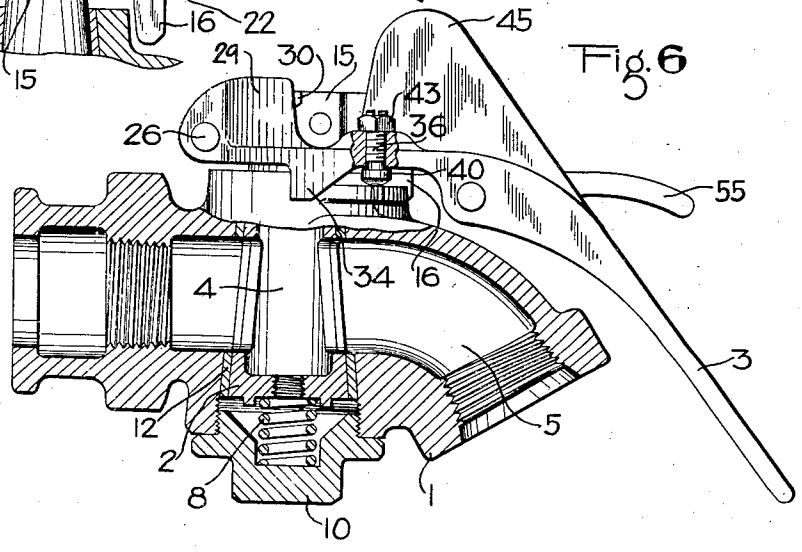


Fig. 6



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UNITED STATES PATENT OFFICE

2,147,287

SELF-LOCKING ANGLE COCK

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Application January 9, 1936, Serial No. 58,351

13 Claims. (Cl. 251—91)

This invention relates to a self-locking angle cock and more particularly to a cock of the type adapted to be employed in the brake pipe at each end of a railway car.

The handles of the angle cocks now in use are pivotally secured to the valve elements in these angle cocks, and are held in a normal or locking position by gravity, and are lifted from this position to an operating position when the valve is moved between the open and closed positions.

It has been found that the handles, when held by gravity alone, tend to oscillate due to vibration and movement of the car as it moves along a track, and that the continuous movement of the handle results in severe wear on the pivotal connection between the handle and the valve, thereby necessitating early replacement of these angle cocks.

It has been found also that there is a possibility that during operation of a train the handles, when held by gravity alone, may be unintentionally lifted from the normal or locking position to the operating position, and may then be turned between the open and closed position, thereby interfering with the operation of the train braking system.

In addition, it has been found that it is the practice of trainmen and others in passing between the cars of a train when crossing over from one side of a train to the other to step on the tops of the angle cocks. The force thereby applied to an angle cock is sufficient to force the plug valve employed in the cock downwardly away from its seat against the spring which is employed to urge the valve towards the seat, and when the valve is moved away from its seat the escaping air carries dirt to the valve seat, which results in damage to the valve seat and necessitates replacement of the cock.

It is the principal object of this invention to provide an improved self-locking angle cock.

Another object of the invention is to provide an improved self-locking angle cock having a latch associated with the handle thereof and adapted to lock the handle in the normal position so as to prevent unintended lifting of the handle to the operating position and prevent unintended turning of the plug valve.

A further object of the invention is to provide an improved self-locking angle cock having means to prevent unseating of the plug valve as a result of the application of downwardly directed force to the upper face of the valve.

Another object of the invention is to provide an improved angle cock having means resiliently holding the handle in the normal position, whereby movement of the handle due to vibration of the car is prevented and wear on the hinge pin of the handle is eliminated.

A further object of the invention is to provide an improved self-locking angle cock having a latch associated with the handle of the cock and adapted to maintain the handle in a normal position, the latch being located in a protected position so that the latch will not rendered inoperative by the deposit of ice, sleet or other foreign material thereon.

Another object of the invention is to provide an improved self-locking angle cock having a handle having stop means engageable with the upper face of the cock body through which downwardly directed force applied to the handle is transmitted to the cock body, whereby unseating of the plug valve by said force is prevented, the handle also having latching means associated therewith and operable to maintain the handle in the position in which the stop means engages the face of the cock body, whereby unintended lifting of the handle and turning of the plug valve are prevented and whereby movement of the handle as a result of vibration is prevented and the accompanying wear on the handle hinge pin is eliminated.

A further object of the invention is to provide an improved self-locking angle cock having latch means associated with the handle and operable to secure the handle against unintended movement away from the normal position, the latch mechanism being arranged so as to offer a minimum of resistance to movement of the handle towards the normal position, and being operable on movement of the handle to a position adjacent the normal position to thereafter assist movement of the handle to the normal position.

Other objects of the invention and features of novelty will be apparent from the following description taken in connection with the accompanying drawings in which,

Fig. 1 is a side elevational view of the improved self-locking angle cock provided by this invention,

Fig. 2 is a fragmentary elevational view, showing the handle raised from the position in which it is shown in Fig. 1,

Fig. 3 is a top plan view showing the handle turned to the closed position.

Fig. 4 is a fragmentary sectional view taken substantially along the line 4—4 of Fig. 2,

Fig. 5 is a top plan view of the valve device

shown in Fig. 1, with the handle in the valve open position,

Fig. 6 is a side view, partly in section, showing the side of the valve opposite from the side which is shown in Fig. 1,

Fig. 7 is a fragmentary sectional view showing the latch mechanism employed in this angle cock, and

Fig. 8 is a view similar to Fig. 7, and showing the handle lifted to the operating position.

As shown in the drawings the angle cock provided by this invention comprises the usual body 1, a plug valve 2 rotatably mounted in said body, and a handle, indicated generally by the reference numeral 3, for turning the plug valve 2 between the open position and the closed position.

The plug valve 2 is provided with a through port 4 adapted in the open position of the cock, as is best shown in Fig. 6 of the drawings, to establish communication through the conduit 5 in the cock body, while in the closed position of the cock the plug valve 2 cuts off communication through the conduit 5.

The plug valve 2 is tapered or conical in form and a spring 8 is provided and extends between the large end of the plug valve 2 and a cap 10, which closes the opening in the cock body in which the plug valve is positioned, and presses the plug valve into engagement with its seat on the tapered bushing 12, which is secured in the opening in the body of the cock. The small end of the plug valve 2 projects from the upper face of the cock body and terminates in a substantially square portion to which is secured, by means of a rivet 14, a member 15.

The member 15 is provided with an outwardly and downwardly projecting finger 16 which is adapted to engage a lug 18 formed on the body 1 to limit movement of the valve 2 towards the open position, while this finger is also adapted to engage a lug 20 formed on the body 1 to limit movement of the plug valve 2 towards the closed position. The member 15 also has positioned above the finger 16 a projecting portion 22 which has formed thereon a cam face which is adapted to be engaged by latch means carried by the handle 3, as will more fully appear below.

The handle 3 is pivotally secured to the member 15 at a point substantially opposite the finger 16 by means of a pin 26. The handle 3 has an opening therein through which extends the member 15, while the portions of the handle on opposite sides of the member 15 have inwardly extending flanges 28 formed thereon which are adapted to engage projections 30 carried by the member 15 to limit upward movement of the handle 3 relative to the cock body.

The handle has a guard 29 formed thereon and extending from the hinge portion of the handle a part of the distance around the opening in which the member 15 is mounted. The guard 29 extends upwardly a distance such that when the handle 3 is in its lower position the top face of the guard 29 is located a short distance above the top face of the exposed portion of the member 15.

The handle 3 also has formed thereon, at points on opposite sides of the plug valve 2, a pair of downwardly extending lugs 32 and 34. The handle lug 32 is adapted to engage the body lug 20 when the handle is in the open position, while the handle lug 34 is adapted to engage the body lug 18 when the handle is in the closed position.

The handle 3 also has adjustable stop means associated therewith to limit downward movement of the handle relative to the cock body, and this means comprises the screws 36 and 38 which are secured in threaded openings in the handle. The screw 36 is provided with a head 40 which is adapted to engage the top face of the body lug 18 when the handle 3 is in the open position, while the screw 38 is provided with a head 42 which is adapted to engage the top face of the body lug 20 when the handle 3 is in the closed position. The screws 36 and 38 are provided with lock nuts 43 and 44, respectively, to secure them in the adjusted positions.

The handle 3 is provided with a hollow projecting portion 45, which extends upwardly to a point substantially above the other portions of the cock so that downwardly directed forces in region of the cock will be applied to this portion of the handle. The projecting portion 45 is located at a point more remote from the hinge pin 26 than are the screws 36 and 38, while the projecting portion 22 carried by the member 15 extends into the cavity on the lower face of this portion of the handle.

The handle 3 has latch means associated therewith and operative to prevent unintended raising of the handle so as to disengage the handle lugs and the body lugs and thus permit turning of the handle and the plug valve. This latch means comprises a latch lever 50 positioned in the cavity on the lower face of the handle 3, as is best shown in Figs. 7 and 8 of the drawings, and pivotally supported on the handle by means of a pin 51.

The latch lever 50 is yieldingly urged in a counterclockwise direction, as viewed in Figs. 7 and 8 of the drawings, into engagement with the cam faces on the member 15 by means of a coil spring 54, which extends between an arm 52 of the latch lever 50 and a portion of the handle 3. Another arm 55 of the latch lever 50 extends through an opening in the handle 3 so as to be accessible on the exposed face of the handle 3.

The portion 22 of the member 15 is provided with a curved cam surface, indicated at 60, which is preferably arranged so that the upper portions thereof are more remote from the hinge pin 26 than the lower portions thereof. The portion 22 has another cam surface, indicated at 62, formed thereon and located immediately beneath the cam surface 60. The cam surface 62 is arranged so that the upper portion thereof is positioned substantially farther from the hinge pin 26 than the lower portion thereof. The cam surface 62 is adapted to be engaged by the end of the arm portion 52 of the latch lever 50, as is best shown in Fig. 7 of the drawings.

In operation, when the handle is in the open position, which is the position in which it is shown in Figs. 1, 5 and 6 of the drawings, the finger 16 on the member 15 is positioned adjacent the body lug 18 so as to prevent rotation of the plug valve 2 in one direction, and when the handle 3 is in the normal or locking position, the handle lug 32 is positioned adjacent the body lug 20 so as to prevent rotation of the plug valve 2 in the other direction.

The handle 3 will be rotated downwardly about the hinge pin 26 by gravity, and will normally move to a position in which the head 40 of the screw 36 rests upon the top face of the body lug 18, thereby limiting downward rotation of the handle 3.

When the handle 3 is in its lower or normal position the arm 52 of the latch lever 50 is moved in a counterclockwise direction by the spring 54,

and the end of this arm presses against the cam surface 62 on the member 15. Because of the shape of the cam surface 62 and of the end of the arm 52, when the arm 52 is pressed against the cam surface 62 the handle 3 is urged downwardly about the hinge pin 26 so as to press the head 40 of the screw 36 firmly against the top face of the body lug 18. This prevents movement of the handle 3 as a result of vibration of the car as it moves along a track and thus eliminates wear on the hinge pin 26.

The cam surface 62 and the end of the arm 52 of the latch lever 50 are arranged so that upwardly directed forces applied to the handle 3 while the end of the arm 52 is in engagement with the cam surface 62 will press the end of the arm 52 against the cam surface 62 and thereby prevent upward movement of the handle, and so that the friction between the end of the arm 52 and the cam surface 62, together with the force exerted on the arm 52 by the spring 54 will prevent movement of the latch lever 50 in a clockwise direction, as viewed in Figs. 7 and 8 of the drawings, so as to release the latch means.

The latch lever 50, therefore, serves to yieldingly press the handle downwardly so that the stop means carried by the handle engages a lug on the body, thereby preventing vibration or movement of the handle which would result in wear on the hinge pin 26, and the latch lever 50 also serves to prevent unintended lifting of the handle to a position which would permit the plug valve to be turned.

If, while the handle 3 is in the open position, a trainman of other person steps upon this angle cock his foot will normally rest upon the projecting portion 45 of the handle 3 as this portion extends above the other parts of the angle cock, and his weight will tend to press the handle 3 downwardly. The force which is applied to the projecting portion 45 of the handle 3 will be transmitted through the handle to the screw 36 and through the head 40 of the screw 36 to the body of the cock 3, and will not tend to press the plug valve 2 downwardly against the spring 8.

The projecting portion 45 is located more remote from the point of connection between the handle 3 and the plug valve 2, which is the hinge pin 26, than is the screw 36, and when downwardly directed force is applied to the projecting portion 45 the handle 3 will tend to move about an axis determined by the head 40 of the screw 36 with the result that the portion of the handle to which the hinge pin 26 is attached will tend to be lifted. The upwardly directed force applied to this portion of the handle will be transmitted through the hinge pin 26 to the member 15, and therefrom through the pin 14 to the plug valve 2, and will tend to lift the plug valve 2 and to press it more firmly into engagement with its seat.

If the foot of the person stepping upon the angle cock does not engage the projection 45 it will engage the top of the guard 29 on the handle 3 and will tend to move the handle towards the body 1. The head 40 of the screw 36 is firmly held in engagement with the top face of the body lug 18 by operation of the latch mechanism carried by the handle with the result that movement of the handle 3 towards the body 1 by force applied to the guard 29 is prevented. As the handle 3 cannot move towards the body 1 the plug valve 2 will not be moved away from its seat against the spring 8 by force applied to the guard 29.

The latch mechanism will tend to press the head 40 of the screw 36 against the top face of the body lug 18 and to cause the handle 3 to fulcrum about the head of the screw 36, and, if there is any looseness or play in the hinge pin 26 the portion of the handle through which the hinge pin 26 extends will be lifted until this play has been taken out.

If downwardly directed force is now applied to the guard 29 the handle 3 will tend to fulcrum about the axis determined by the head 40 of the screw 36, the portion of the handle through which the hinge pin 26 extends moving towards the body 1, and the portion of the handle on the other side of the screw 36 moving away from the body 1.

The latch mechanism is carried by the latter portion of the handle 3 and movement of this portion of the handle is transmitted through the latch mechanism to the member 15 and tends to move the member 15 away from the body 1. This movement of the member 15 tends to lift the plug valve 2 and to press it more firmly into engagement with its seat.

When it is desired to turn the valve from the "open" position to the "closed" position the operator grasps the handle 3 and presses downwardly on the arm portion 55 of the lever 50 so as to move the lever 50 in a clockwise direction against the spring 54, and thereby move the end of the arm 52 away from the cam surface 62. This releases the latch means, and, while maintaining the pressure applied to the latch lever 50, the operator may then lift the handle 3, causing the handle to pivot about the hinge pin 26. The handle 3 is lifted upwardly until its movement is arrested by engagement of the flange portions 28 on the handle with the projecting portions 30 carried by the member 15. The handle 3 is now substantially in the position in which it is shown in Fig. 2 of the drawings, and in this position the handle lug 32 is out of alignment with the body lug 20, while the handle lug 34 on the opposite side of the handle is lifted above the body lug 18.

The handle 3 and the plug valve 2 may now be turned in a counterclockwise direction, as viewed in Figs. 3 and 5 of the drawings, and on movement of the handle substantially to the position in which it is shown in Fig. 3 of the drawings further turning of the plug valve 2 is prevented by engagement of the finger 16 with the body lug 20.

The handle 3 is now moved downwardly about the hinge pin 26 to the normal position, and on movement of the handle to the normal or locking position, the handle lug 34 is moved into alignment with the body lug 18 so as to prevent return movement of the handle or the plug valve as long as the handle 3 is in the normal or locking position. It will be seen that when the plug valve is moved to the "closed" position, and the handle returned to the normal position, movement of the plug valve in one direction is prevented by engagement of the finger 16 carried by the member 15 with the body lug 20, while movement of the plug valve in the opposite direction is prevented by engagement of the handle lug 34 with the body lug 18.

On the release of pressure on the latch lever 50 by the operator the spring 54 causes the latch lever 50 to move in a counterclockwise direction so that the end of the arm portion 52 again engages the cam surface 62 on the member 16, urging the handle 3 to move downwardly.

When the handle 3 is in the "closed" position, which is the position in which it is shown in Fig.

3 of the drawings, the screw **36** is out of alignment with the body lug **18**, while the screw **38** has been moved into alignment with the body lug **20** and engages the top face thereof, and on downward movement of the handle **3** by the spring **54** associated with the latch lever **50**, the head **42** of the screw **38** engages the body lug **20** to limit downward movement of the handle **3**, while upward movement of the handle will be prevented by engagement of the arm **52** with the cam surface **62**. The handle, therefore, will be prevented from moving as a result of vibration of the car so that wear on the hinge pin **26** is eliminated in this position of the handle as well as in the "open" position of the handle.

The cam surface **60** is arranged so that if the operator fails to return the handle **3** to the normal position it will tend to return to this position of its own accord. Thus the lower portion of the cam surface **60** is positioned less distant from the hinge pin **26** than is the upper portion of this cam surface, and if the operator releases the pressure on the latch lever **50** while the handle **3** is in the position in which it is shown in Fig. 8 of the drawings, the arm **52** will be pressed against the cam surface **60** by the spring **54**. Downward movement of the handle **3** will not be opposed by the spring **54**, however, but on the contrary, will be assisted by the spring **54** as the lower portion of the cam surface **60** is positioned less distant from the hinge pin **26**, about which the handle **3** rotates, than is the upper portion of the cam surface **60**.

As a result the handle **3** will tend to move downwardly because of the force of gravity acting thereon, and also as a result of vibration of the handle which may occur on movement of the car. When the handle **3** has moved downwardly to a position such that the arm **52** no longer engages the cam surface **60**, and such that the end of the arm **52** engages the cam surface **62**, the spring **54** will press the end of the arm **52** against the cam surface **62**, and thereby urge the handle **3** downwardly until the head **42** of the screw **38** engages the body lug **20** to prevent further downward movement of the handle **3**, while the latch means will operate as described in detail above to prevent unintended lifting of the handle **3**.

If, while the handle **3** is in the "closed" position, a trainman should step on this angle cock his foot will engage the projecting portion **45** and the force applied thereto will press the handle **3** downwardly so as to press the head **42** of the screw **38** against the top of the body lug **20**, which will prevent downward movement of the handle **3**.

The projecting portion **45** is located more distant from the hinge pin **26**, which connects the handle to the plug valve **2**, than is the screw **38**, and on the application of downwardly directed force to the projecting portion **45** the handle **3** will tend to move about an axis determined by the head **42** of the screw **38**, thereby tending to lift the portion of the handle through which the hinge pin **26** extends, and upwardly directed force applied to this portion of the handle **3** will be transmitted to the plug valve **2** and will tend to press the plug valve more firmly against its seat.

If the foot of the person stepping on the angle cock does not engage the projecting portion **45** it will engage the guard **29** and will press the handle towards the body **1**. Movement of the handle **3** towards the body **1** in this position of the handle is prevented by engagement of the head **42** of the screw **38** with the top of the body lug **20**, and the plug valve **2** will not be moved away from its seat as a result of the application of force to the guard **29**.

If there is looseness or play in the hinge pin **26** the plug valve **2** will be pressed more firmly into engagement with its seat on the application of force to the guard **29** as explained in detail in the description of the operation of the handle in the "open" position.

In order to move the handle from the "closed" position to the "open" position downwardly directed force is applied to the arm **55** of the latch lever **50** so as to release the latch lever, and, while maintaining this force applied to the latch lever **50**, the handle **3** is lifted upwardly until its movement is prevented by engagement of the flanges **28** with the projections **30** on the member **15**. When the handle **3** has been lifted to this position the handle lug **34** is out of alignment with the body lug **18**, while the handle lug **32** is out of alignment with the body lug **20**.

The handle may now be turned from the "closed" position to the "open" position and its movement in this direction will be limited by engagement of the finger **16** on the member **15** with the body lug **18**.

After the handle **3** has been moved to the position in which the finger **16** engages the body lug **18** the handle is turned downwardly about the hinge pin **26** until its movement is prevented by engagement of the head **40** on the screw **36** with the top face of the body lug **18**. On this movement of the handle **3** the handle lug **32** is moved into alignment with the body lug **20** so as to prevent return movement of the handle to the "closed" position.

On the release of pressure from the arm **55** of the latch lever **50** the spring **54** moves the end of the arm **52** into engagement with the cam surface **62** so as to prevent unintended lifting of the handle **3**, and to maintain the head **40** of the screw **36** in engagement with the top face of the body lug **18** and thereby prevent vibration of the handle and wear on the hinge pin **26**.

If after the handle **3** is turned from the "closed" position to the "open" position the operator fails to move the handle downwardly to the normal or locking position the handle will tend to return to this position of its own accord, as explained in detail above.

It will be seen that the latch mechanism employed in the angle cock provided by this invention is of simple and rugged construction and is located in the cavity on the lower face of the handle **3** so as to be protected by the handle. This prevents the latch mechanism from becoming inoperative as a result of the deposit of snow, ice, sleet or other foreign material thereon, which might interfere with the release of the latch mechanism and prevent a trainman from moving the handle of the angle cock from one of its positions to the other of its positions.

It will be seen also that the handle has adjustable stop means associated therewith to regulate downward movement of the handle in the "open" position, this means being the screw **36**, and has other adjustable stop means to limit its downward movement in the "closed" position, this means being the screw **38**.

The screws **36** and **38** are independently adjustable so that the position of the handle determined by each of these screws may be accurately adjusted, with the result that the relationship between the end of the arm **52** of the latch lever **50**, and the cam surface **62** on the member **15**, may be correctly regulated in both

the "open" and "closed" positions of the handle.

In addition it will be seen that the handle 3 has projecting means associated therewith and extending above the other portions of the cock so that downwardly directed forces in the region of the cock will be applied to this portion of the handle, and that they are transmitted therefrom through the handle directly to the cock body in a manner which not only does not tend to move the plug valve away from its seat, but which tends to press the plug valve more firmly into engagement with its seat. There is, therefore, no possibility that the plug valve will be moved away from its seat and that the escaping air will carry dirt to the seat of the plug valve which will damage the seat and necessitate replacement of the valve.

While one embodiment of the improved self-locking angle cock provided by this invention has been illustrated and described in detail, it should be understood that the invention is not limited to these details and that numerous changes and modifications may be made without departing from the scope of the following claims.

Having now described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. A valve device of the class described comprising, in combination, a body, a plug valve disposed in said body and oscillatable about a substantially vertical axis, a handle pivotally associated with the valve and movable relative thereto about a substantially horizontal axis, the handle being positioned on the upper face of the valve device, and stop means associated with the handle and engageable with means associated with the valve body to limit downward movement of the handle relative to the body, the handle having means associated therewith and projecting upwardly to a point substantially above the other portions of the valve device, said projecting means being positioned at a point spaced from the point of connection between the handle and the valve, the stop means being positioned intermediate the projecting means and the point of connection between the handle and the said valve.

2. In a valve device of the type described, in combination, a body, a plug valve disposed in said body and oscillatable about a substantially vertical axis, a handle pivotally associated with the valve and movable relative thereto about a substantially horizontal axis positioned at one side of the axis of the valve, the handle being positioned on the upper face of the valve device and having means associated therewith and projecting upwardly therefrom to a point substantially above the adjacent portions of the valve device whereby downwardly directed forces in the region of the valve device will be applied to the handle, said projecting means being disposed on the side of the axis of the valve opposite from the point of connection between the handle and the valve, and stop means associated with the handle and engageable with the body of the valve device to limit downward movement of the handle relative to the body, said stop means being positioned intermediate the projecting means on the handle and the point of connection between the handle and the valve.

3. In a valve device of the class described, in combination, a body, a plug valve disposed in said body and oscillatable about an axis, a handle for moving said valve, said handle being pivotally associated with said valve so as to be movable towards and away from the valve, the handle having means associated therewith and projecting away from the valve device to a point more remote from the valve device than the other portions of the valve device, said projecting means being positioned at a point spaced from the point of connection between the handle and the valve, and stop means associated with the handle and engageable with means carried by the body to limit movement of the handle towards the valve, said stop means being positioned intermediate the projecting means and the point of connection between the handle and the valve.

4. In a valve device, in combination, a body, a valve mounted in said body, a handle pivotally associated with the valve and operable to move the valve between an open position and a closed position, the handle being movable towards and away from the valve, and stop means to limit movement of the handle towards the valve when the handle is in the open position, said stop means comprising means associated with the handle and cooperating with means carried by the body, and stop means to limit movement of the handle towards the valve when the handle is in the closed position, said means comprising means associated with the handle and cooperating with means carried by the body, the means for limiting movement of the handle in the open position including an adjustable member and the means for limiting movement of the handle in the closed position including an adjustable member independent of the means for limiting movement of the handle in the open position, whereby the position of the handle determined by the stop means in either the open or closed positions may be adjustably varied independently of the position of the handle determined by the stop means in the other of the said positions.

5. In a valve device of the type described, in combination, a body, a valve mounted in said body and oscillatable about an axis, a handle associated with the valve and movable relative thereto towards and away from the valve, the handle having a normal position and being adapted to be moved therefrom away from the valve to an operating position for moving said valve, the handle having a portion thereon projecting away from the valve to a point more remote from the valve than the adjacent portions of the valve device whereby forces directed towards the valve in the region of the valve device will be applied to the handle, stop means comprising cooperating elements associated with the handle and the body and operable to limit movement of the handle towards the valve and to transmit from the handle to the body force applied to the handle and tending to move the handle towards the valve, the handle having a cavity formed in the face thereof opposite the projecting portion thereon, and latch means positioned in said cavity and operable to lock the handle in the normal position against movement to the operating position.

6. In a valve device of the type described, in combination, a body, a valve mounted in said body and oscillatable about an axis, a handle associated with the valve and pivotal relative thereto towards and away from the valve, the handle having a normal position and being adapted to be moved therefrom away from the valve to an operating position for moving said valve, the handle having a portion thereon projecting away from the valve to a point more remote from the valve than the adjacent portions of the valve device whereby forces directed to-

wards the valve in the region of the valve device will be applied to the handle, stop means comprising cooperating elements associated with the handle and the body and operable to limit movement of the handle relative to the body in the direction of the valve and to transmit from the handle to the body force applied to the handle and tending to move the handle towards the valve, the handle having a cavity formed in the face thereof opposite the projecting portion thereon, and latch means positioned in said cavity and operable to lock the handle against movement to the operating position and to urge the handle to the position determined by the stop means.

7. In a valve device of the type described, in combination, a body, a valve mounted in said body and oscillatable about an axis, a handle associated with the valve and pivotal relative thereto towards and away from the valve, the handle having a normal position and being adapted to be moved therefrom away from the valve to an operating position for moving said valve, the handle having a portion thereon projecting away from the valve to a point more remote from the valve than the adjacent portions of the valve device whereby forces directed towards the valve in the region of the valve deice will be applied to the handle, stop means comprising cooperative elements associated with the handle and the body and operable in the normal position of the handle to limit movement of the handle relative to the body in the direction of the valve and to transmit from the handle to the body force applied to the handle and tending to move the handle towards the valve, the handle having a cavity formed in the face thereof opposite the projecting portion thereon, latch means positioned in said cavity and operable to lock the handle in the normal position against movement to the operating position, and means positioned on the exposed face of the handle for releasing the latch means so that the handle may be lifted to the operating position.

8. In a valve device of the type described, in combination, a body, a plug valve mounted in said body, a handle pivotally connected to said plug valve and movable from a normal position to an operating position and being operable in the operating position to move the plug valve between its open and closed positions, means associated with the body and the handle and operative when the handle is in the normal position to prevent movement of the plug valve between its open and closed positions, latch means associated with the handle for locking the handle in its normal position, and means operable through said latch means when the handle is in its operating position to yieldingly urge the handle to move to its normal position.

9. A valve device of the class described comprising in combination, a body, a plug valve mounted in said body, a handle pivotally associated with said valve and movable from a normal position to an operating position and being operable in the operating position to move the plug valve between its open and closed positions, means associated with the body and the handle and operative when the handle is in the normal position to prevent movement of the plug valve between its open and closed positions, a member carried by the plug valve and having a cam surface thereon including a locking portion and a release portion, a latch element carried by said handle, a spring yieldingly pressing said latch element against said cam surface, said cam surface portions and said latch element being arranged so that when the latch element engages the locking portion of the cam surface it prevents movement of the handle away from the normal position, and so that when the latch element engages the release portion of the cam surface it permits movement of the handle away from the normal position, said cam surface portions and said latch element being also arranged so that when the handle is moved from the operating position to the normal position the latch element is moved out of engagement with the release portion of the cam surface and into engagement with the locking portion thereof without the latch element being moved against the spring associated therewith.

10. In a handle for use on a valve device having a body provided with a plug valve mounted therein and movable about an axis between an open position and a closed position, the plug valve having an end projecting from said body, the body having a pair of lugs formed thereon, said lugs being spaced apart circumferentially of said plug valve, the handle comprising a member adapted to be pivotally connected to said plug valve so as to be movable away from the valve device body to an operating position in which it is operable to move the plug valve between its open and closed positions, said member being movable towards the valve device body to a normal position in which portions of said member engage said lugs to prevent movement of the plug valve between its open and closed positions, and means for limiting movement of said member towards said valve device body, said means comprising means carried by said member and engaging one of said lugs only in the open position of the plug valve, and other means carried by said member and engaging the other of said lugs only in the closed position of the plug valve.

11. In a valve device of the class described, a body, a plug valve mounted in said body and movable relative to said body between an open and a closed position, a handle pivotally secured to said plug valve and movable relative thereto away from said body to an operating position in which it is operable to move the plug valve between its open and its closed positions, said handle being movable towards said body to a normal position in which movement of the plug valve between its positions is prevented, means for limiting movement of the handle towards the body, means associated with the plug valve and having thereon an inclined locking surface, a latch element carried by the handle and having thereon an inclined surface adapted to engage said inclined locking surface and when in engagement therewith to urge the handle to move towards the normal position and thereby cause the handle to be held in the position determined by the means limiting movement thereof towards the body and thus prevent movement of the handle as a result of vibration, yielding means associated with the latch element and pressing the inclined surface on the latch element against the inclined locking surface, the surface on the latch element and the locking surface being arranged so that when they are in engagement movement of the handle away from the normal position is prevented, and means for moving said latch element against the yielding means to release the latch element and

permit the handle to be moved to the operating position.

12. In a valve device of the class described, in combination, a body, a plug valve mounted in said body and movable relative thereto between an open position and a closed position, a handle pivotally connected to said plug valve and movable relative thereto away from the valve device body to an operating position in which the handle is operable to move the plug valve between its open and closed positions, said handle being movable towards said body to a normal position in which movement of the plug valve between its positions is prevented, stop means for transferring from the handle to the body independently of the plug valve forces applied to the handle tending to move the handle towards the valve device body, said means comprising cooperating elements associated with the handle and the body, said elements engaging each other in the normal position of the handle, means associated with the plug valve and having a locking surface thereon, a latch element carried by the handle, yielding means pressing said latch element against said locking surface, the latch element being operative when pressed against said locking surface to prevent movement of the handle away from the normal position and to cause movement of the handle to the position determined by the stop means and to thereafter prevent movement of the handle as a result of vibration, whereby wear on the pivotal connection between the handle and the plug valve is reduced, and means for moving the latch element against said yielding means to release the latch element and permit the handle to be moved to the operating position.

13. In a device of the class described, in combination, a body, a plug valve mounted in and movable relative to said body between an open position and a closed position, a handle pivotally connected to said plug valve and movable relative thereto about an axis away from said body to an operating position in which it is operable to move the plug valve between its open and closed positions, said handle being movable towards said body to a normal position in which movement of the plug valve between its positions is prevented, a member carried by said plug valve and having thereon an operating surface having a locking portion and a release portion, a latch element carried by said handle, and means associated with said element and yieldingly pressing said element against said operating surface, the latch element and the locking portion of the operating surface being arranged so that when the latch element is pressed into engagement with said surface the handle is held against vibratory movement and against movement away from the normal position, the release portion of the operating surface being arranged so that the distance from the axis of the handle to said surface progressively increases away from the locking portion of said operating surface, whereby when the latch element is pressed against said operating surface release portion movement of the handle towards the normal position is assisted.

CLYDE C. FARMER.

CERTIFICATE OF CORRECTION.

Patent No. 2,147,287. February 14, 1939.

CLYDE C. FARMER.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 5, second column, line 54, claim 5, after the word "operable" insert in the normal position of the handle; page 6, first column, line 30, claim 7, for "cooperative" read cooperating; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 31st day of October, A. D. 1939.

(Seal)

Henry Van Arsdale,
Acting Commissioner of Patents.