

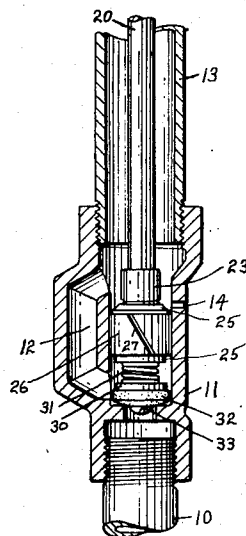
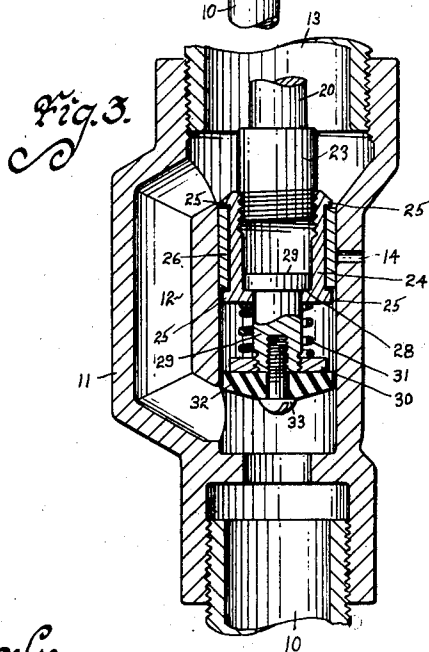
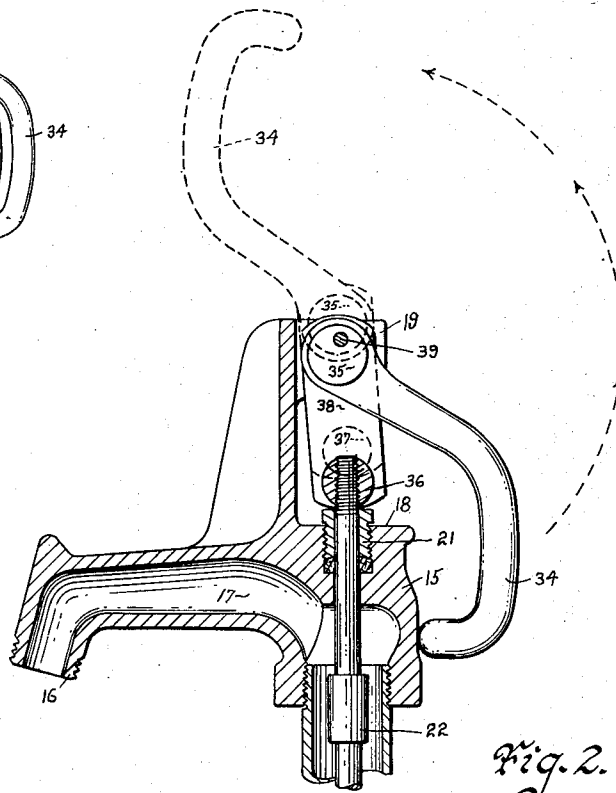
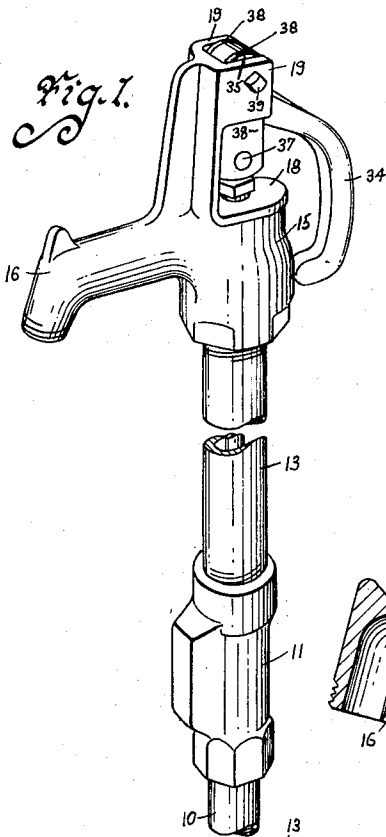
Aug. 18, 1953

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2,649,111

YARD HYDRANT

Filed July 16, 1949



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2,649,111

YARD HYDRANT

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Application July 16, 1949, Serial No. 105,160

5 Claims. (Cl. 137—304)

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Hydrants are not new and have long been used in connection with large water systems. However, as electric power has now made it possible, especially for farmers, to pump water from their own wells under pressure, individual yard hydrants have become increasingly more commonplace.

The benefits of a water system to the farmer cannot be utilized unless he can deliver the water where it is needed, such as the watering trough or in his barn or the like. Thus, to have water available when and where he needs it, a yard hydrant is usually located at selected sites. Obviously, such sites are frequently in the open and therefore precautions must be taken to prevent ice from forming in the hydrant during cold weather and thereby rendering it inoperable. This is done by placing the lower valve portion in the ground below the frost line or by placing it in a covered pit adjacent the pump, and having only the upper nozzle part extending above the surface. Also, present type yard hydrants are provided with a drain hole in the valve seat body to carry off the water left in the standpipe after the valve is closed and it also provides a place for water to drain out into the ground in the event of leakage around the valve seat washer. This latter purpose is necessary for while valves are not supposed to leak they frequently do, and if the water from such a leak should rise in the standpipe above the frost line, it will freeze in cold weather.

However, most present type yard hydrants having the features above enumerated have several disadvantages, particularly for the farmer, which I will endeavor to point out.

Quite frequently a farmer will desire to turn his hydrant on for a continuous slow flow such as for a milk-cooling tank or keeping a watering trough at a desired level or the like. To do this, will often result in a considerable leakage and loss of water through the drain hole in the valve seat body. This is true because present type hydrants are constructed so that the valve assembly on the valve stem running to the valve seat will close off the drain hole only when the valve is substantially fully opened. Consequently, if the valve is only partially open as is the case for a slow flow, the drain hole is either partially closed or not closed at all with the result that over an extended period of time a substantial amount of water passes out through the drain hole as well as out of the nozzle. This is an important factor when water is pumped

from a well because the more water loss through leakage, the more the pump will operate, and in case of a low water supply the unnecessary waste of water can become critical.

Another disadvantage in present hydrants is apparent from the fact that as the valve seat washer becomes worn and compressed, the water will leak through and at times can be observed dripping from the nozzle in the same fashion as the commonly observed leaky faucet. This occurs because the leak around the valve seat washer becomes greater than the capacity of the drain hole to carry it off, with the result that the water rises in the pipe until it drips from the nozzle. Not only does this waste valuable water the same as the slow flow does, but in freezing weather the water above the frost line will freeze and thereby make it impossible to use the hydrant without thawing it out.

In the use of yard hydrants, it is often desirable to know whether the hydrant is fully closed so that no unnecessary leakage will be taking place and this can only be ascertained by going to the hydrant and testing the handle. Obviously, if by looking across an area and observing the position of the handle one could ascertain whether it was fully closed, such a handle means would save a lot of unnecessary steps. However, most present type hydrants usually have a wheel knob or toggle handle whose open or closed positions cannot be ascertained from any distance away from the hydrant.

These objections and disadvantages I have overcome by my invention, the principal object of which is to provide a yard hydrant having a valve designed to permit the flow of water at any given rate less than the maximum for which the valve is capable without permitting any leakage or waste through the drain hole in the hydrant.

A further object of this invention is to provide a valve in a yard hydrant that will automatically maintain a fully closed position to prevent any leakage even when the valve seat washer has begun to wear and which valve is further provided with a second manually operable means for adjustment to compensate for wear of the valve seat washer that has progressed to a degree greater than that which the automatic adjusting means will correct.

A still further object of this invention is to provide in a yard hydrant a lever handle operatively associated with the valve member and designed to be capable of permitting a flow of

water at any rate desired within the capacity of the valve without the use of springs, hooks, catches or the like.

A still further object of this invention is to provide a lever handle for a yard hydrant whose fully closed or open position or any intermediate position of adjustment can be ascertained by visual observation from a distance.

A still further object of my invention is to provide a yard hydrant that is refined in appearance, economical in manufacture, durable in construction and efficient in use.

These and other objects will be apparent to those skilled in the art.

My invention consists in the construction, arrangement, and combination of the various parts of the device, whereby the objects contemplated are attained as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Fig. 1 is a perspective view of this device ready for use,

Fig. 2 is an enlarged cross-sectional view of Fig. 1 of this device showing the valve in closed position, with the dotted lines in the upper portion of the figure indicating the open position of the lever handle, and

Fig. 3 is an enlarged cross-sectional view of the valve assembly in Fig. 2 of this device but showing the valve in open position.

Referring to the drawings I have used the numeral 10 to designate the standard water main pipe through which water is pumped under pressure. The numeral 11 designates a valve seat body housing provided with the U-shaped channel 12 that communicates with the inlet and outlet portions of the housing, as shown in Fig. 3. The inside of the inlet and outlet portions of the housing 11 are threaded so that the inlet portion can be secured to the pipe 10 and the outlet portion can communicate with the standpipe 13. The numeral 14 designates a standpipe drain hole provided in the housing 11. A nozzle is provided comprising the integrally formed portions, consisting of a jacket head chamber 15, the nozzle 16 that is threaded on its outside end portion, the water channel 17, a U-shaped open portion that has a bottom surface 18 in common with the top surface of the head chamber 15, as shown in Fig. 1 and Fig. 2, and two spaced apart horizontal bearing ears 19 above the U-shaped open portion to form the top of the nozzle head. The purpose of this open portion will be later described in detail.

The pipe 13 at its upper end communicates with the lower portion of the head chamber 15 and at its lower end with the housing 11, as heretofore described, thus forming a continuous water channel from the pipe 10 to the nozzle 16.

The numeral 20 designates a valve stem that is threaded at its upper end and arranged with the standpipe 13. The upper threaded end portion of this valve stem 20 slidably extends up through the head chamber 15 and protrudes above the surface 18 of the head chamber 15, as shown in Fig. 2. The numeral 21 designates a standard water-tight gland consisting of the gland packing and gland nut sleeve arranged within the head chamber 15. In Fig. 2 I show a connecting sleeve 22 because I preferably use a brass rod for the valve stem above the sleeve 22 while the portion below is of any suitable material. However, this is not necessarily required and the valve stem can be in one piece, if desired. My purpose in using the brass portion

just described is not only for additional strength but because it will not rust, whereas many other types of tubing or pipe will rust and this in turn tends to tear the packing and thereby increase the possibility of leakage at this point. Also, if the valve stem is not formed from one piece of metal, the different portions may be the same size or different, and if different then an adapter sleeve must be used to join them together.

The lower end of the valve stem extends down into the housing 11 and is operatively associated with the valve and plunger assembly which I will now describe. The numeral 23 designates a sleeve secured to the bottom of the valve stem, and the numeral 24 designates a cylindrical plunger threaded to the lower portion of the sleeve 23 and arranged within the housing 11, as shown in Fig. 3. The sleeve 23 and plunger 24 can be made in one piece as well as in two, as shown in my drawings, without affecting its function or efficiency. The numeral 25 designates two peripheral flanges respectively that are integrally formed on the top and bottom edges of the plunger 24 and the numeral 26 designates a resilient collar member arranged on the plunger between the flanges 25. As shown in Fig. 2, this collar is formed from a resilient metal strip having diagonally cut ends 27 which are in spaced apart relation after the strip is bent into a collar to be positioned as above described. The purpose of this spaced apart position is to increase the resiliency of the collar so that as the valve assembly travels vertically toward its open position the collar 26 is in frictional engagement with the housing and operates to close the drain hole, and the purpose of the diagonal position of the ends is to make certain that some portion of the collar will always cover the drain hole when the valve is open. If the ends were in vertical spaced relation rather than diagonal spaced relation, the spaced apart portion might possibly get in alignment with the drain hole with the result that opening of the valve would not close the drain. However, any resilient material such as rubber, leather or the like may be used for this collar 26. The numeral 28 designates an inwardly extending circumscribing lip formed in the lower inside end portion of the plunger and the numeral 29 designates a fillister head bolt slidably protruding from the bottom of the plunger 24 with the bolt head resting on the lip 28, as shown in Fig. 3. The numeral 30 designates a flat retaining washer threaded to the end of the bolt 29 and the numeral 31 designates a coil spring arranged on the bolt 29 and having one end in communication with the washer 31 and its other end in communication with the bottom of the plunger 24, as shown in Fig. 2 and Fig. 3. The numeral 32 designates a valve seat rubber washer detachably secured to the bottom of the bolt 29 by the stud screw 33.

The numeral 34 designates a lever handle member shaped substantially as shown in Fig. 2. The sides of the upper end portion of the handle 34 are flat and each of these sides are machined to form a stub shaft 35 that projects laterally therefrom. The numeral 36 designates a block bearing member that has a threaded hole through it, and a boss portion 37 formed on two opposite sides thereof. The numeral 38 designates two flat rectangular metal strap link members provided with holes in each respective end portions. The bearing member 36 is threaded to the top of the valve stem 20 where it protrudes above the surface 18. One end of one of the

link members 38 is arranged on one of the boss members 37 and the other end thereof is arranged on one of the stub shafts 35. The second link member 38 is similarly arranged on the opposite side on the boss and stub shaft of the bearing member and handle respectively. The stub shaft portion of the handle is eccentrically arranged between the bearing ears 19 by means of the bolt and nut 39, as shown in Fig. 1 and Fig. 2. In this position the bearing ears 19 serve to keep the strap link member in place and no other securing means for this purpose is necessary.

My hydrant constructed and assembled as above described will operate in the following manner. The raising or lowering of the valve stem by means of the lever handle 34 will, of course, raise or lower the valve seat washer to control the flow of water under pressure from the pipe 10, as desired. As the handle is raised, it will, because of the eccentric, raise the strap link member 38 which in turn will raise the bearing member 36 that is threaded to the valve stem, thereby opening the valve. The handle will remain at any degree of open position desired without any catches, springs, hooks or the like and the pressure of the water on the valve will not be able to open it any further because of the counter-balancing resistance offered by the handle due to the manner in which it is mounted.

The bearing member 36 provides a means for adjusting the valve seat washer when it is first installed and later if it should become unduly worn and compressed. In first installing the valve if it should be found that the valve seat washer does not fit tight enough, or later when the washer may have become worn, the bearing member can be rotated counterclockwise to lengthen the valve stem and likewise if the washer fits too tightly the bearing member can be rotated clockwise to shorten the valve stem. To thus have easy access to this bearing member I have positioned it above the head chamber 15 and in the U-shaped open portion of the nozzle head above referred to.

It will be noted that when the valve is in closed position, as shown in Fig. 2, that the standpipe drain hole 14 in the housing 11 is not covered by the collar 25 on the plunger 24. However, the collar on the plunger will close this drain hole as it rises with the opening of the valve and as the valve is closed, the plunger passes below the drain hole to permit the water in the standpipe to drain out. In this operation it should also be noted that before the collar on the plunger closes the drain hole in its upward movement it must of necessity travel the short distance between the hole and the top of the plunger and thus in present type hydrants if a slight opening of the valve is desired for a continuous slow flow, the drain hole will either be only partially closed or not closed at all because the valve seat washer moves in unison with the plunger, thereby creating the disadvantages hereto mentioned. However, in my device I provide the coil spring 31 that serves a two-fold purpose, to-wit: First, it will for a time maintain the valve seat washer in closed position even after the plunger has started an upward movement calculated to open the valve. This is true because when the valve is closed the coil spring is compressed and because the bolt 29 is vertically slidably arranged within the plunger 24 the valve seat washer will not be able to rise until the slack between the head of the bolt 29 and the lip 28 is taken up. This slack is

sufficient for the collar 26 to completely close the drain hole 14 before the valve seat washer is released. Thus, a valve assembly constructed as I have described will permit a continuous flow of water at any degree desired within the capacity of the valve without permitting any leakage through the drain hole.

Secondly, because this spring is compressed when the valve is closed it is constantly exerting a downwardly pressure on the valve seat washer. Consequently, if the valve seat washer begins to wear, the tension in the coil spring will automatically tend to maintain it tightly in the valve seat and compensate for wear, thereby prolonging the useful life of the washer and more important, providing an additional safeguard against preventing leakage and the resulting waste of valuable water. Should the valve seat washer become worn to a degree greater than the coil spring can compensate for, then an additional manual adjustment can be made by the bearing member at the top of the valve stem as previously described.

The handle on my invention is shaped so that it can be easily grasped by hand and because of its position relative to the nozzle head, its open or closed position can be ascertained merely by visual observation. This is of great advantage at times to the farmer who may wish to look across his barn or yard area to see whether his hydrant is on or off.

Some changes may be made in the construction and arrangement of my yard hydrant without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims, any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope.

I claim:

1. In combination with a nozzle head on a hydrant having a head chamber, a pair of spaced apart ears extending from said nozzle head above and spaced from said head chamber, and a valve stem slidably disposed in said chamber, an actuating means for said valve stem, comprising, a lever handle having one end pivotally eccentrically arranged between said ears in vertical alignment with said valve stem, and a rigid strap member connecting said lever at its point of attachment to said ears to said valve stem.

2. In combination with a nozzle head on a hydrant having a head chamber, a pair of spaced apart ears extending from said nozzle head above and spaced from said head chamber, and a valve stem slidably disposed in said chamber, an actuating means for said valve stem, comprising, a lever handle having one end pivotally eccentrically arranged between said ears in vertical alignment with said valve stem, a rigid strap member connecting said lever at its point of attachment to said ears to said valve stem, and said lever capable of vertical movement on its pivotal connection of at least one hundred eighty degrees.

3. In combination with a nozzle head on a hydrant having a head chamber, a pair of spaced apart ears extending from said nozzle head above and spaced from said head chamber, and a valve stem slidably disposed in said chamber, an actuating means for said valve stem, comprising, a lever handle having one end pivotally eccentrically arranged between said ears in vertical alignment with said valve stem, a transverse stub shaft formed on the end of said lever disposed within said ears, a block member threaded to

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said valve stem, a boss on said block member, a rigid strap member provided with a hole on each end with one of said holes embracing said stub shaft and the other embracing said boss, and the inner side of one said ears engaging a portion of said strap to maintain it in operating position.

4. In combination with a nozzle head on a hydrant having a head chamber, a pair of spaced apart ears extending from said nozzle head above and spaced from said head chamber, and a valve stem slidably disposed in said chamber, an actuating means for said valve stem, comprising, a lever handle having one end pivotally eccentrically arranged between said ears, and a rigid strap member connecting said lever at its point of attachment to said ears to said valve stem; said pivotal connection of said lever and said strap being in endwise alignment with said valve stem.

5. In combination with a nozzle head on a hydrant having a head chamber, a pair of spaced apart ears extending from said nozzle head above and spaced from said head chamber, and a valve stem slidably disposed in said chamber, an actuating means for said valve stem, comprising, a lever handle having one end pivotally eccentrically arranged between said ears in vertical alignment with said valve stem, a rigid strap

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member connecting said lever at its point of attachment to said ears to said valve stem, said lever handle vertically movable on its pivotal connection to said ears and capable of maintaining any position desired between and including the extremities of its sphere of movement.

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