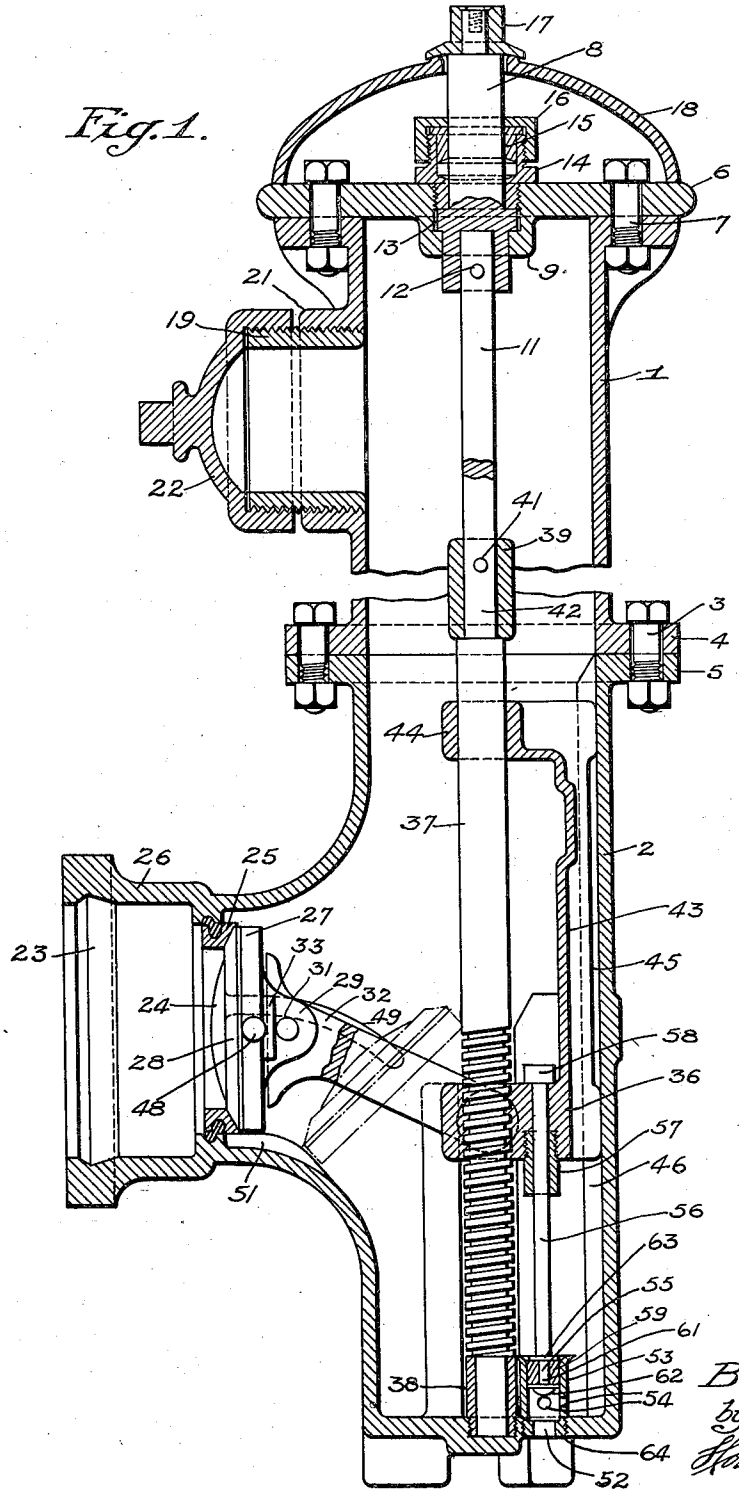
Nov. 5, 1935. B. L. HAYNER 2,020,181

HYDRANT

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Fig. 1.



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Fig. 2.

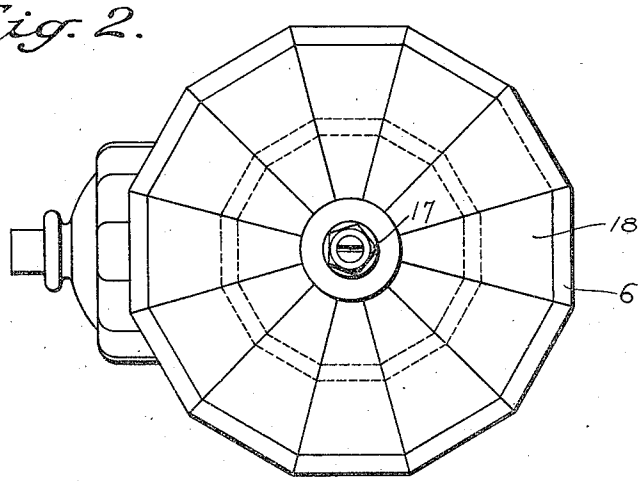
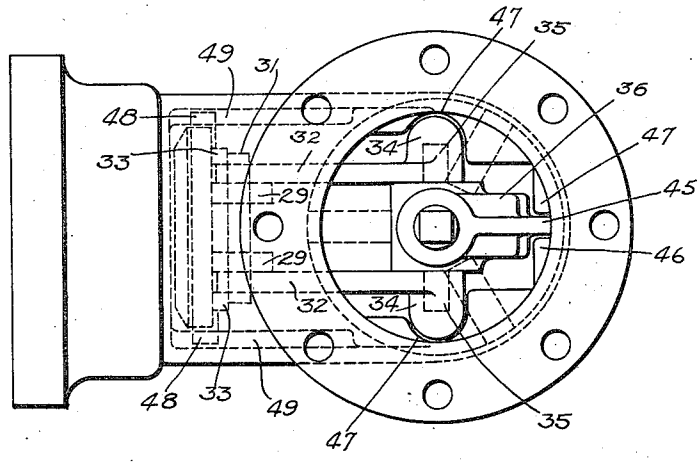


Fig. 3.



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2,020,181

HYDRANT

Burdette L. Hayner, Troy, N. Y.

Application July 13, 1932, Serial No. 622,338

7 Claims. (Cl. 137—13)

This invention relates to improvements in fire hydrants, and has for an object the provision of an efficient and durable hydrant of relative simplicity of form and low manufacturing cost.

Another and more specific object of the invention is to provide a hydrant so designed that the gate or valve when open constitutes a deflector to direct the water stream to the nozzle to thereby reduce eddy currents within the hydrant structure and to insure an efficient flow of water therethrough to the nozzle.

Still another object of the invention is to provide a hydrant wherein proper seating of the gate or valve when closed is assured.

A further object of the invention is to provide a hydrant having upper and lower separable sections through which the gate-operating mechanism extends, together with means for so coupling the portions of said mechanism occupying said sections that they readily separate upon removal of the upper section, thereby preventing damage to or displacement of the gate mechanism occupying the lower section by accidental displacement of the upper section.

A still further object of the invention is to provide a hydrant wherein the casing is provided at the bottom with a drain port, together with novel and positive means for closing said drain when the hydrant gate or valve is unseated.

Another object of the invention is to provide a hydrant wherein the operation of unseating the gate or valve is a relatively rapid one.

The invention further resides in certain novel structural features hereinafter set forth and illustrated in the attached drawings, in which:

Figure 1 is a vertical sectional view of a hydrant made in accordance with my invention;

Fig. 2 is a plan view of the upper portion of the hydrant, and

Fig. 3 is a plan view of the lower portion of the hydrant with the upper portion removed.

With reference to the drawings, a hydrant made in accordance with my invention comprises upper and lower casing sections 1 and 2 respectively which are adapted to be connected through the medium of bolts 3 which pass through flanges 4 and 5 at the lower and upper ends respectively of said sections. The upper or head section 1 is provided with a head plate 6 which is secured at the upper end of the section by means of bolts 7. A shaft 8 is seated for rotation in a central depressed portion 9 of the head plate 6 and projects downwardly through an opening in the bottom of said recess, the projecting portion of the shaft being adapted to receive a second shaft 11 which is held in place within the socketed lower end of the shaft 8 by means of a pin 12. As illustrated in Fig. 1, the shaft 8 is provided with a projecting flange 13 which bears upon the bottom of the head plate recess, and the said shaft is held rotatably in position within the recess through the medium of a stuffing box 14 surrounding the shaft and threaded into the recess in the head plate above the flange 13 of the shaft. Packing is confined within the stuffing box 14 around the shaft 8 through the medium of a gland 15, this gland being held in place by means of a follower cap 16 threaded on the top of the stuffing box. The shaft 8 has secured to its upper end a nut 17 by means of which the shaft may be rotated, and this nut is flanged at its lower end to retain in position upon the head plate 6 a dome 18 which embraces the upper ends of the bolts 7 and the stuffing box elements described above, this dome being apertured for passage therethrough of the upper end of the shaft 8.

The head section 1 of the hydrant is provided in the present instance with a discharge nozzle 19 which in the present instance is threaded into a boss 21 in the side of said head section and is adapted for reception of a cap 22 which normally closes this discharge port. It will be noted that the aforesaid described arrangement of parts is such that the shaft 11 extends downwardly through the center of the head section 1 whereby additional nozzle outlets for the head section may be employed projecting at various points around the head section without being obstructed by said shaft.

The lower or base section 2 of the hydrant is provided at one side with an inlet port 23 which is normally closed by a gate or valve 24, a suitable seat in the form of a ring 25 being secured within the inlet port extension 26. The gate 24 comprises a body plate 27 and a face plate 28 suitably secured thereto and adapted for engagement with the seat 25 when the gate is closed. At the inner side of the body plate 27 are lugs 29, see Fig. 3, which are apertured for reception of a pin 31 through the medium of which the gate is pivotally secured to the ends of a pair of arms 32. As shown in Fig. 3, the ends of the arms 32 which are connected as described to the gate are confined between the lugs 29 and small lugs 33 spaced outwardly of the said lugs 29 as shown.

The opposite ends of the arms 32 are provided with recessed bosses 34 which receive trunnion pins 35 projecting from opposite sides of a nut 36, this nut being carried by a threaded stem 37

extending longitudinally of the lower section 2. The lower end of this stem is supported in a vertical bearing 38 in the bottom of the hydrant section and is adapted at its upper end to be connected with the lower end of the shaft 11 through the medium of a coupling 39. This coupling is secured through the medium of a pin 41 to the lower end of the shaft 11 and fits slidably over the rectangular reduced upper end 42 of the stem 37.

The nut 36 is provided with an extension 43 which extends upwardly in the base section 2 of the hydrant substantially parallel to the stem 37, and this extension has at its end a transversely projecting portion 44 which slidably embraces the stem 37. The extension 43 has a longitudinal web 45 which also slidably engages the side wall of the hydrant section 2 and is confined between parallel guides 46 which project inwardly from the casing wall. The entire nut structure is thus permitted free movement longitudinally in the base section 2 of the hydrant casing, but is prevented from rotation about the stem 37.

As shown in Fig. 3, the bosses 34 of the arms 32 are rounded at their outer sides and fit within vertical guide recesses 47 formed in the inner wall of the hydrant casing 2. This arrangement permits pivoting of the arms about the trunnions 35, but insures retention of the arms upon the trunnion pins. At the same time provision is made for readily separating the arms 32 from the trunnions when the nut is elevated to a position clearing the arms from the guide recesses 47. It will be noted further in the event that the stem 37 is unscrewed from the nut 36, the nut and the arms 32 are still supported in their relative positions by reason of the nut 36 being retained between the guide elements 46, and the bosses 34 of the arms 32 being similarly retained within the guides 47. At the same time, the entire valve assembly, after the stem 37 has been removed, may also be removed from the casing base section by turning the gate inwardly toward the nut from the open position shown in broken lines in Fig. 1.

In manipulating the gate to the seated and to the open positions through the medium of the stem 37, the gate is guided in a normal path by a pair of cylindrical lugs 48 which project transversely from opposite sides of the gate. These lugs cooperate with the undersides of a pair of curved ribs 49 which project inwardly from the opposite side walls of the casing. In opening and closing, the lower edge of the gate slides upon a rib 51, and the gate is confined to a normal path on this rib by engagement of the projections 48 with the ribs 49. The gate being flexibly secured to the arms 32 adjusts itself to the seat 25 so that a complete seal is insured. In the fully open position, however, the cylindrical projections 48 clear the inner ends of the ribs 49, as shown in broken lines in Fig. 1, and thereby permit adjustment of the gate inwardly to a substantially vertical position permitting withdrawal of the gate from the casing when the stem 37 has been removed as described above.

A drain port 52 is provided in the bottom of the casing 2, this port being surrounded by a sleeve 53 threaded into the port 52 and having in the side thereof ports 54. The upper end of the sleeve 53 is slightly flared to permit ready entrance of a plunger 55 on the lower end of a stem 56 which projects upwardly through the nut 36 and through a sleeve 57 threaded into and projecting downwardly from the bottom of the nut. At its upper end, which projects beyond the upper end of the nut, is an enlarged head portion 58 which when the nut is elevated to close the gate insures elevation of the plunger 55 to the position shown in Fig. 1 wherein the drain opening 52 and the ports 54 are open to admit passage of water from the interior of the casing 2. The plunger 55 consists of a rubber or other suitable sleeve 59 which embraces a terminal portion 61 of the stem 56 of reduced diameter and which is confined between washers 62 and 63 on the stem. When the nut 36 is moved downwardly on the threaded stem 37 to open the gate, the sleeve 57 engages the upper washer 63 and forces the plunger 55 downwardly in the sleeve until the washer 62 engages the shoulder 64 at the lower end of the sleeve. Further downward movement of the nut has the effect of compressing the sleeve 53, thereby insuring a positive sealing of the ports 54 and preventing flow of water from the drain. Movement of the nut 36 again closing the gate 24 by engagement of the nut with the head 58 insures elevation of the plunger to the position shown in Fig. 1 wherein the drain is open.

It will be apparent from the above description that the device is extremely simple in form, easy to assemble and readily dismantled. The drain is also simple and positive in operation, and the arrangement is such that in the event that the head casing 1 is partially or completely broken off, the shaft 11 immediately frees itself from the stem 37, so that the gate mechanism itself is unaffected and undamaged. The portion 44 of the nut 36 also acts to reinforce the stem 37 to prevent damage due to displacement of the stem from the normal position. There may of course be modification without departure from the invention.

I claim:

1. In a hydrant, a casing having intake and discharge ports and spaced parallel ribs extending longitudinally therein to form a groove, a threaded stem extending axially of said casing and mounted for rotation therein, an elongated element having terminal portions embracing said stem, one of said portions being threaded and engaging the threaded portion of the stem, and another portion of said element slidably engaging the groove formed by said ribs in the casing preventing rotation of the element while permitting movement thereof axially of the stem, a valve adapted to close said intake port, trunnions at opposite sides of said nut, arms having one end secured to said valve and having sockets at the other end adapted to receive the respective trunnions, and guide means in said casing for the said socketed ends of said arms preventing displacement of the arms from the trunnions while permitting movement of the arms with the nut longitudinally of the stem.

2. In a hydrant, a casing having intake, discharge and drain ports, a threaded stem mounted for rotation in said casing, a nut engaging said threaded stem, means in the casing preventing rotation of the nut while permitting movement thereof axially of the stem, a valve adapted to close said intake port, trunnions at opposite sides of said nut, arms having one end secured to said valve and having sockets at the other end adapted to receive the respective trunnions, guide means in said casing for the said socketed ends of said arms preventing displacement of the arms from the trunnions while permitting movement of the arms with the nut longitudinally of the stem, and means directly connected to said nut

and movable therewith to open and close the drain port.

3. In a hydrant, a casing having intake, discharge and drain ports, a threaded stem mounted for rotation in said casing, a nut engaging said threaded stem, means in said casing preventing rotation of said nut while permitting movement thereof axially of the stem, a valve adapted to close said intake port, arms having one end secured to said valve, means on the nut engaging the other end of each of said arms, means in said casing to prevent disengagement of the arms from said means on the nut while permitting movement of said arms with the nut longitudinally of the stem, a plunger adapted to close the drain port, and a stem connecting the plunger to the nut actuating the former plunger to open and close the drain part.

4. In a hydrant, a casing having intake and discharge ports in the side walls thereof, a valve arranged to close said intake port, means operatively connected to said valve for actuating the same to open the intake port, an arcuate rib extending inwardly of the casing toward the lower end thereof from the bottom of said intake port, projections extending laterally from opposite sides of the valves, and other arcuate ribs extending inwardly of the casing in the direction of the first mentioned rib from the sides of the intake port and cooperating with said projections and the first mentioned rib to guide the valve in a predetermined path when actuated to open the intake port.

5. In a hydrant, a casing having intake and discharge ports in the side walls thereof, a threaded stem rotatably mounted axially in said casing, a nut on said threaded stem, means for preventing rotation of the nut while permitting movement thereof axially of the stem, an arcuate rib extending inwardly of the casing toward the lower end thereof from the bottom of the intake port, a valve element resting on said rib and seated in said intake port, means connecting the nut and the valve element whereby rotation of the stem in opposite directions results in movement of the valve on the rib to and from its seat, projections extending laterally from opposite sides of the valve element, and other arcuate ribs extending inwardly of the casing in the direction of the first mentioned rib from the sides of the intake port and cooperating with said valve projections and the first mentioned rib to guide the valve element in a predetermined path when actuated through the medium of said threaded stem to a position at an angle with respect to the intake port so that fluid entering the casing through the same is deflected in the direction of the discharge ports by said valve element.

6. In a hydrant, a casing having intake and discharge ports and spaced parallel ribs extending longitudinally therein to form a groove, a threaded stem extending axially of said casing and mounted for rotation therein, an elongated element having terminal portions embracing said stem, one of said portions being threaded and engaging the threaded portion thereof and another portion of said element slidably engaging the grooves formed by said ribs in the casing preventing rotation of said element while permitting movement thereof axially of the stem.

7. In a hydrant, a casing having intake and discharge ports and spaced parallel ribs extending longitudinally therein to form a groove, a threaded stem extending axially of said casing and mounted for rotation therein, an elongated element having terminal portions embracing said stem, one of said portions being threaded and engaging the threaded portion thereof and another portion of said element slidably engaging the grooves formed by said ribs in the casing preventing rotation of the element while permitting movement thereof axially of the stem, a valve adapted to close said intake port, means connecting said valve to the threaded portion of the elongated element, and means for rotating the stem to actuate the elongated element axially of the casing actuating the valve to open and close said intake port.

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