

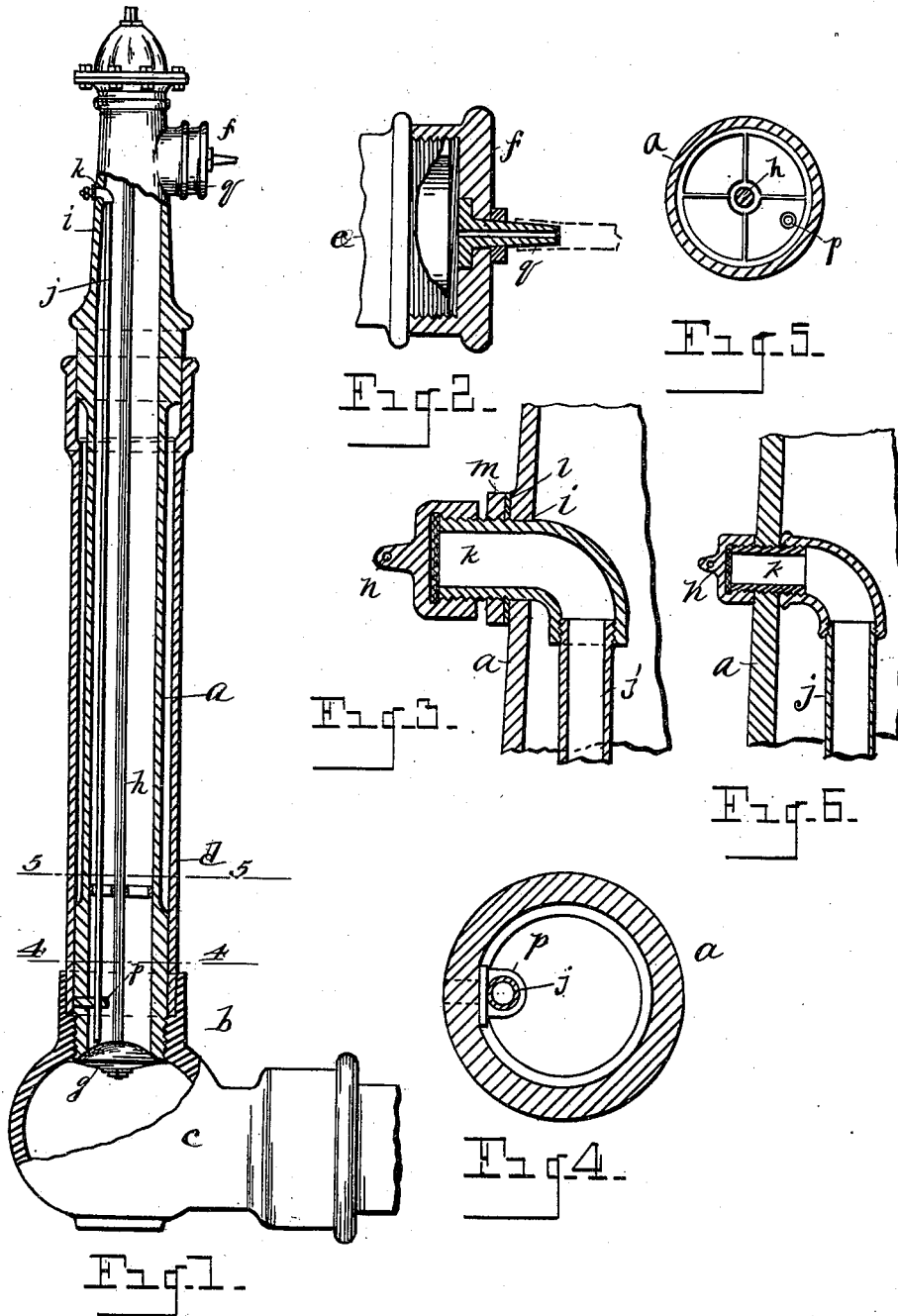
No. 649,159.

D. W. CARROLL.
FIRE HYDRANT.

Patented May 8, 1900.

(Application filed Oct. 30, 1899.)

(No Model.)



WITNESSES.

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FIRE-HYDRANT.

SPECIFICATION forming part of Letters Patent No. 649,159, dated May 8, 1900.

Application filed October 30, 1899. Serial No. 735,153. (No model.)

To all whom it may concern:

Be it known that I, DANIEL W. CARROLL, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Fire-Hydrants; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention has for its object certain new and useful improvements in fire-hydrants; and it consists of the construction, combination, and arrangement of devices hereinafter specified and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a view, partly in vertical section and partly in elevation, illustrating my invention. Fig. 2 is a detail view showing the cap of the hydrant provided with a nozzle. Fig. 3 is an enlarged view in detail and in vertical section, showing features of my invention. Fig. 4 is a horizontal section through the stand-pipe only on the line 4 4, Fig. 1. Fig. 5 is a horizontal section through the stand-pipe only on the line 5 5, Fig. 1. Fig. 6 is a partial vertical section illustrating a modification.

Heretofore, as is well known, much trouble has been experienced from the liability of hydrants freezing in winter or in having the hydrant-valve frozen to its seat, so that the hydrant cannot be operated without considerable trouble to first thaw out the frost, so as to get the hydrant into working order. To overcome this difficulty in cities provided with sewerage, it has been customary to connect the hydrant with the sewer. So desirable has such drainage been heretofore considered that the waste-pipe has often been conducted a very considerable distance in order to communicate with the sewer, involving a very large expense for digging and piping. In order to secure proper drainage, and thereby prevent the freezing of the hydrant, the hydrant has frequently been located to disadvantage in other respects. In many places where hydrants are used there is no sewerage, as in the outskirts of cities and in smaller

towns or villages, and of course such a connection is therefore impossible, and no adequate and practicable means of relief has heretofore been employed to free the hydrant from waste water and prevent freezing. In many cases to prevent freezing it has heretofore been common to leave an open waste-orifice at the base of the hydrant to permit the water to leak away into the surrounding soil; but this has been thoroughly impracticable when the hydrant was placed in a low, hard, or wet soil, for the reason that such an open orifice only permits the surface water or the water in the soil to run back into the hydrant instead of giving any relief. But even when the hydrant is connected with the sewer or other drainage it has been found by experience that the difficulty has by no means been effectually overcome. Where a hydrant is constructed to have the stand-pipe screwed out of the ground, leaving the frost-jacket, it is not practicable to connect a drain-pipe leading to a sewer with the stand-pipe directly in a hydrant of this description, for if a drain-pipe were so connected the stand-pipe of the hydrant could not be screwed out of the ground. The drain-pipe when used has therefore been commonly connected to the hub or shoe supporting the stand-pipe, the base of the stand-pipe above and adjacent to the valve-seat being provided with a small opening near the adjacent end of the drain-pipe, this construction obviously leaving a space between the drain or waste pipe and the waste-orifice in the stand-pipe, affording opportunity for surface water or water in the adjacent soil to back up into the interior of the hydrant, which frequently occurs wherever the moisture in the soil is of such quantity that the small waste-pipe connected into the hub cannot carry it off. The water thus backing up into the hydrant often results in the freezing of the hydrant in cold weather, especially in the fall of the year when the rains have fallen, whereby the hydrant fills with surface water. In consequence of such faulty constructions and arrangements it has not infrequently been found necessary on occasion of a fire to first thaw out the hydrant after the fire-engine has reached the spot, or where, as in towns which do not use fire-engines, but where

direct pressure in the main is employed, it has been necessary in winter to provide some device whereby the water may be heated and pumped into the hydrant to thaw it out when frozen, involving great delay in time of emergency, resulting in increased headway of the fire, and greatly obstructing the progress. Moreover, where hydrants are connected thus with a sewer the sewer-gases are liable to back up into the hydrant, often destroying the working parts.

My invention relates, therefore, more particularly to new and useful improvements in fire-hydrants, by which the hydrants may be relieved from all waste water which may remain in them upon closing the valve controlling the admission of water from the main or which may accumulate therein for any reason, the purpose of the invention being to relieve the hydrants of waste water and to prevent all liability of their freezing in cold weather.

More specifically still, my present invention is designed as an improvement upon a fire-hydrant for which United States Letters Patent were granted to me May 15, 1888, No. 382,951, my present invention being designed more especially to be applied to hydrants already in use. In the patent referred to a hollow valve-stem was employed. In manufacturing a new hydrant the hollow stem might be readily employed; but in an old hydrant already constructed provided with a solid stem the application of a hollow stem instead would necessitate the expense of taking out the old stem and throwing it aside in order to substitute a new hollow stem. In another form of construction shown in said patent a channel was cast integrally with the formation of the stand-pipe, which, however, would of course not be applicable to old hydrants already in use. In still another form of construction a pipe was brought up from above the valve on the outside of the stand-pipe; but such forms of hydrants are not screwed from the hub. Therefore my present invention is intended to provide a more economical and more satisfactory appliance to secure the object in view and whereby the hydrants may be effectually prevented from freezing and kept in constant readiness for use.

Accordingly the object of my present invention is to provide a hydrant stand-pipe with an interior waste-pipe which may be readily engaged therein through which all the water in the stand-pipe can be forced out therefrom by pressure of air or steam admitted into the interior of the stand-pipe.

I accomplish my present invention as follows: The stand-pipe or outlet-pipe of a hydrant is indicated in the accompanying drawings at *a*, the hydrant shown herewith having a screw-threaded engagement, as shown at *b*, with a hub *c*, so that the stand-pipe can be screwed out of the ground or out of the hub. A customary frost-jacket is in-

dicated at *d*. The stand or outlet pipe is constructed with the usual discharge-nozzle, (indicated at *e*,) with which the hose may be connected and through which the water from the hydrant is commonly discharged, said nozzle being provided with a customary cap *f* to close the same. A valve is shown at *g* provided with a valve-stem *h* and arranged to be seated and opened in the usual manner. These parts may be of any desired construction.

To apply my present invention to a stand-pipe or outlet-pipe already in use in a simple and effective manner, I bore an orifice of suitable size toward the top thereof, as indicated at *i*. A drain-pipe, (indicated at *j*,) preferably provided with an elbow *k* at its upper end, has its elbow inserted through said bore or orifice at *i* from the interior of the stand-pipe, the end of the elbow projecting through the wall of the stand-pipe to the exterior a sufficient distance to receive a suitable gasket or packing *l*, a lock-nut *m*, and a cap *n*, with an intervening gasket or packing *r*, the outer end of the elbow being threaded to receive the lock-nut and the cap. The gasket or packing *l* and the lock-nut make the connection of the elbow with the stand-pipe tight, so as to prevent leaking. The cap is preferably made of brass and is constructed with the gasket or packing *r* to effectually close the upper end of the pipe *j*. The lock-nut draws the upper end of the pipe *j* up snugly against the inner surface of the stand-pipe, and the upper end of the pipe *j* is thus firmly held in place. The drain or waste pipe *j* extends downward within the outlet or stand pipe into close proximity to the valve *c*. The lower end of the pipe *j* may be held in place by an I-bolt or other suitable device, (indicated at *p*,) threaded or otherwise secured in the base of the stand-pipe.

In the application of my invention to stand-pipes already in use having a waste-orifice at bottom, the I-bolt *p* may be secured in the customary waste-orifice in the base of the stand-pipe, thereby closing said orifice. The I-bolt or other similar device is of course designed to have a tight joint or connection with the stand-pipe. The base of the pipe *j* will thus be held firmly in place and prevented from vibration.

Pressure may be applied to the interior of the stand-pipe in any suitable manner. Thus as a matter of convenience the cup *f* may be provided with a nipple *q*, to which a suitable hose may be connected, through which air or steam may be forced into the stand-pipe, and thus the waste water may be effectually and entirely driven out of the stand-pipe. In such a construction it is obvious that there is no opening in the base of the hydrant through which surface water or water from the soil can back up thereinto, nor can any sewer-gas back up into the stand-pipe, for I am thus enabled to dispense with all sewer connections. The waste-pipe *j* may be of

any suitable material and of any suitable dimensions. It will be obvious, furthermore, since the upper end of the pipe *j* is effectually closed in the use of the hydrant when
 5 supplying water that air is forced up within said pipe, the pipe forming an air-chamber in the stand-pipe, preventing the waste-pipe *j* being filled with water, so that there is no liability of said pipe freezing up when the
 10 hydrant is in use in supplying water. In a device of this character there is no necessity of using a primed pump, as any ordinary air-pump may be employed in forcing the water out of the stand-pipe after it has been opened
 15 for a fire, or steam may be supplied for the purpose from a fire-engine. Instead of locating the nipple *q* in the cap *f* it might be located at any other point of the stand-pipe, if preferred. The use of a hollow valve-stem
 20 as embodied in said patent necessarily confines the discharge-channel to one of small diameter; but in my present invention the waste-pipe *j* may be of any desired size, and I am thereby enabled to get a larger channel
 25 than where a hollow valve-stem is employed. To apply the waste-pipe *j* to the interior of a hydrant already in use, the stand-pipe may simply be disconnected from the hub of the water-pipe, the valve removed, and the
 30 waste-pipe inserted and secured in place, and in some forms of hydrants the pipe may be inserted from the top of the hydrant, without taking the same out of the ground or removing the valve, simply by taking the top
 35 off the hydrant.

This invention dispenses with the cost of sewer drainage and effectually overcomes the difficulties of sewer drainage even where such drainage is practicable and effectually prevents any water standing in the stand-pipe.

Instead of forming the elbow *k* integrally with the pipe *j* any ordinary elbow or pipe connection may be employed, with a nipple to extend through the case of the stand-pipe.
 45 In the latter case the orifice *i* in the stand-pipe may be threaded and a nipple *s* be engaged in the threaded portion of the stand-pipe. The nipple might be secured through the case of the stand-pipe and an elbow *t* be
 50 engaged therewith. With this construction a lock-nut on the exterior of the nipple would not be required. This modification is illustrated in Fig. 6.

Among the points of advantage and utility
 55 of the construction embodied herein it will be noticeable that the appliance can readily be attached either to new hydrants or to ordinary hydrants in common use in a simple and economical manner. The application of the invention affords a simple, ready, and positive
 60 means of testing the hydrants at all times to see whether they are in readiness for use or not, and this testing can be accomplished in a few minutes without opening it or turning the water off. In any position it affords perfect relief to the hydrant, and with its use it

does not become necessary to locate the hydrants with reference to sewers or other advantageous positions for drainage, and the hydrant can be placed in any desired position
 70 for its best employment. At the approach of freezing weather the hydrants can readily be drained and tested by means of a small hand air-pump. When through working on fires in freezing weather, steam-pressure from the
 75 steam-engines or air-pressure from the delivery-hose of the engine may be used instead of the hand-pump to relieve the hydrant of waste water, if preferred. The time necessary to thoroughly drain a hydrant of this
 80 system requires but a few seconds, and in case of clogging or stopping up of the drain-pipe the pressure can readily be reversed and the obstruction readily blown out. There is obviously no possibility of surface water getting
 85 into the hydrant, as the stand-pipe has no waste-opening at its base, but is securely closed, nor can any sewer-gas enter to destroy the interior and working parts of the hydrant.

The apparatus herein described cannot get
 90 out of order.

By the use of my invention all sewer drainage, involving great expense, is entirely dispensed with, and thus a great saving is effected, while at the same time the invention
 95 is thoroughly reliable, positive, and durable.

I would have it understood that a pressure may be exerted upon the water within the stand-pipe in any suitable manner or by any suitable means, as by a hand air-pump or by
 100 steam or air pressure from an engine, applied in any desired way. So, also, it will be evident that suction might be applied to the upper end of the drain-pipe *h* to suck the water out of the stand-pipe, the latter also
 105 being contemplated within the scope of my invention.

What I claim as my invention is—

1. The combination with the outlet-pipe of a fire-hydrant provided with a controlling-
 110 valve and valve-stem, of a drain-pipe made separate from the valve-stem and the outlet-pipe and located within the outlet-pipe, the upper end of the drain-pipe opening through the casing of the outlet-pipe and having a
 115 tight connection therewith, means to close the upper end of said drain-pipe, and means whereby pressure may be applied within the outlet-pipe to expel water through the drain-pipe.

2. The combination with the outlet-pipe of a fire-hydrant provided with a controlling-
 120 valve and valve-stem, of a drain-pipe made separate from the valve-stem and the outlet-pipe and located in the interior of the outlet-
 125 pipe, the upper end of the drain-pipe opening through the casing of the outlet-pipe, and the lower end of the drain-pipe extended into proximity to the valve, means to hold the upper end of the drain-pipe in place and to form
 130 a tight connection with the outlet-pipe, means to close the upper end of the drain-pipe, and

means whereby pressure may be applied within the outlet-pipe to expel water therefrom through the drain-pipe.

3. The combination with the outlet-pipe of
5 a fire-hydrant, of a drain-pipe located there-
within having at its upper end an elbow ex-
tended through the casing of the outlet-pipe,
a gasket or packing, and a lock-nut engaged
10 upon the outer end of the elbow to make a
tight joint and hold the drain-pipe in place,
means to close the outer end of the drain-
pipe, and means whereby pressure may be
applied within the outlet-pipe to expel water
therefrom through the drain-pipe.

15 4. The combination with the outlet-pipe of
a fire-hydrant provided with a controlling-
valve and valve-stem, of a drain-pipe made
separate from the valve-stem and the outlet-
pipe and located within the outlet-pipe, said
20 drain-pipe having at its upper end an elbow
opening through the casing of the outlet-pipe,
means engaging said elbow to make a tight
joint with said casing and hold the drain-pipe
in place, means to close the upper end of the
25 drain-pipe, and means whereby pressure may

be applied within the outlet-pipe to expel wa-
ter therefrom through the drain-pipe.

5. The combination with the outlet-pipe of
a fire-hydrant provided with a controlling-
valve and valve-stem, of a drain-pipe made
30 separate from the valve-stem and the outlet-
pipe and located within the outlet-pipe, the
upper end of the drain-pipe opening through
the casing of the outlet-pipe, means to en-
gage the upper end of the drain-pipe with the
35 outlet-pipe to make a tight joint and hold the
drain-pipe in place, means to close the outer
end of the drain-pipe, a device within the
lower end of the outlet-pipe to engage the
lower end of the waste-pipe therewith and
40 hold the lower end of the drain-pipe in place,
and means whereby pressure may be applied
within the outlet-pipe to expel water there-
from through the drain-pipe.

In testimony whereof I sign this specifica- 45
tion in the presence of two witnesses.

DANIEL W. CARROLL.

Witnesses:

N. S. WRIGHT,
M. HICKEY.