

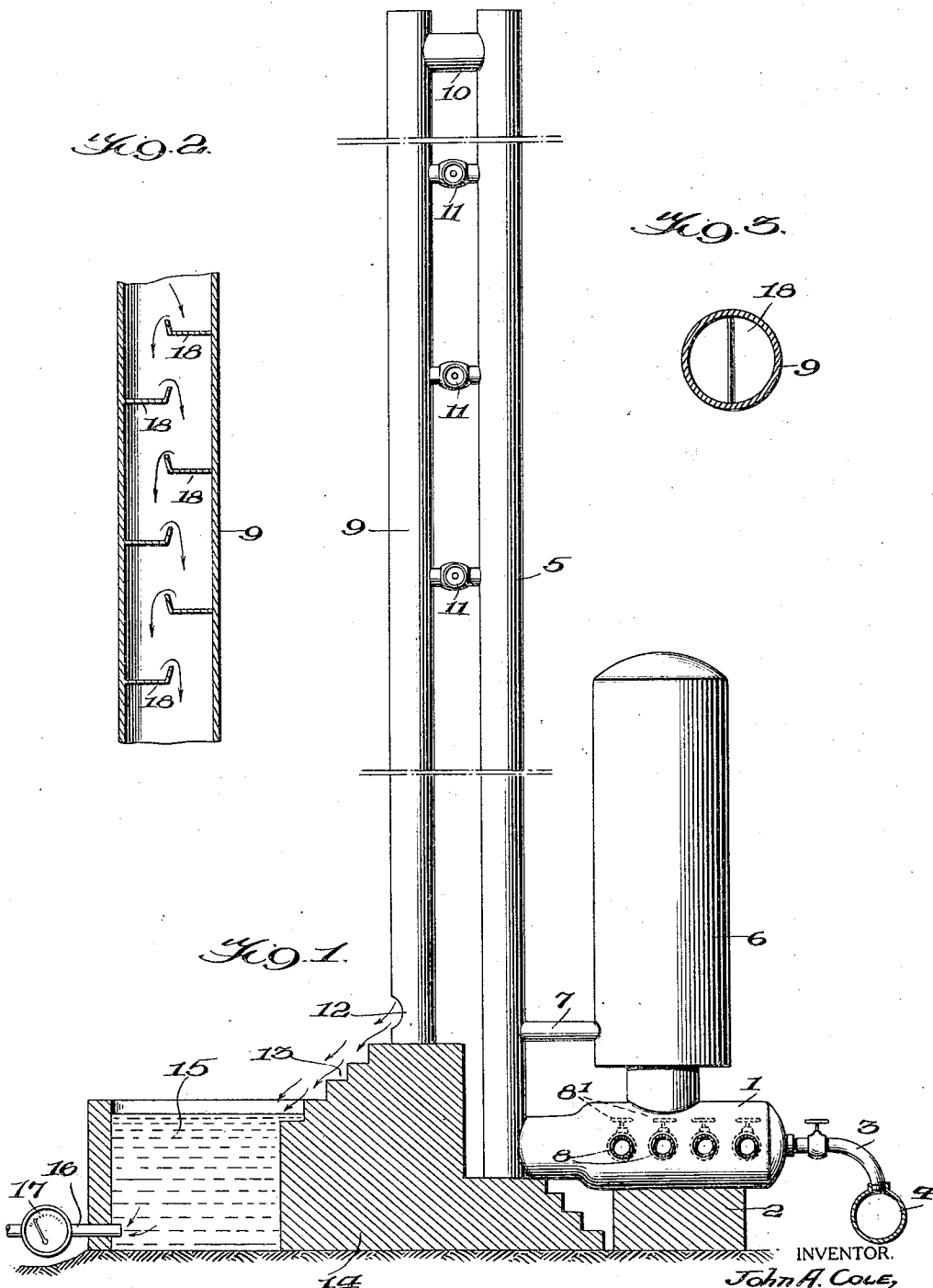
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AUTOMATIC WATER SUPPLY CONTROL

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AUTOMATIC WATER-SUPPLY CONTROL.

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My invention consists in new and useful improvements in automatic water supply control.

In many cities having no suitable sites for storage reservoirs, pumping stations are employed, where from one to a dozen large engines are used to pump water into the distribution pipes and maintain a sufficient pressure to carry the water to consumers throughout the city.

Many of these pumping engines are very large, and discharge from ten to sixty million gallons each, per day, at a standard pressure of from forty to seventy pounds per square inch, and, due to the enormous fly wheels and other moving parts, it is practically impossible to regulate their rapidity of action to meet the constantly fluctuating demand for water in a city.

Thus the amount of water being pumped, and forced into the distribution pipe remains the same at all times, while the actual consumption of water by the inhabitants of the city changes from time to time. This causes a great strain at times on the water system, and any weak places or flaws in the pipes, are apt to give way and cause a leak sooner or later.

After this has gone on for years there are, of course, a vast number of leaks in the system, which necessitates the use of additional pumping engines in order to maintain sufficient pressure, and also the discharge of more water from the source of supply, a great quantity of which is wasted.

It is the object of my invention to overcome these disadvantages and to provide an apparatus which will collect as much of the extra pumpage as is practicable; measure it and return it to the source of supply, or other place where it can be utilized.

A further object is to remove the air which is often introduced by the pumps and which collects in the tops of the pipes, displacing the solid water.

A still further object of my invention is to provide an air chamber and stand pipe, whereby an elasticity of flow in the water system is obtained.

With the above and other objects in view which will appear as the description proceeds, my invention consists in the novel features herein set forth, illustrated in the accompanying drawings and more particularly pointed out in the appended claims.

In the drawings, numerals of like character designate similar parts throughout the several views.

Fig. 1 is a side view of my apparatus.

Fig. 2 is a sectional view of a portion of the overflow pipe, and

Fig. 3 is a sectional view of the same from the top looking down.

Referring to the drawings, 1 represents a cylindrical receiver, mounted on a suitable base 2, and opening at one end into a connection 3, which leads to the city supply main 4. The opposite end of the receiver 1 opens into a vertically extending stand pipe 5, while the top of said receiver is connected to an air chamber 6, which in turn is connected to the stand pipe 5 by means of a pipe 7.

In one side of the receiver 1 is a plurality of apertures in which are mounted a series of pipes 8, leading from the numerous pumps (not shown) and each provided with a valve 8'.

The stand pipe 5 is connected at its upper extremity and at predetermined points down its wall, to an overflow pipe 9, the upper connection 10 serving at all times as an outlet for excess water from the stand pipe into the overflow pipe. The connections 11 are provided with valves whereby the height of the water in the stand pipe may be regulated, thus controlling the pressure in the system.

The lower end of the overflow pipe 9 is provided with an outlet aperture 12 which opens onto a series of steps 13 on the masonry base or foundation 14 which will be referred to later.

15 designates a basin for catching the overflow, provided with an outlet pipe 16 on which is mounted a recording instrument 17.

In order to break up the force of the water falling in the overflow pipe 9, I have provided a series of baffle pans 18, in staggered relation throughout the length of said pipe.

The operation of my improved apparatus is as follows:

Water is constantly pumped from its source of supply into the receiver 1 through the pipes 8, from whence it is forced to the main 4 through the pipe 3, for city consumption. Any air entering the receiver with the water rises into the air chamber 6 where it is compressed by the pressure of the water, and serves as a cushion, as will be hereinafter described.

All water over the amount required to sup-

ply the city's fluctuating demand, backs up into the stand pipe 5 and overflows into the pipe 9 through either connection 10 or one of the valved connections 11, as the case may be. The fall of the overflowing water in the pipe 9 is broken by the baffle pans 18, as shown by the arrows in Fig. 2, and the water is discharged from said pipe 9 through the aperture 12, onto the steps 13 which further break its fall as it enters the overflow basin 15. From this basin, the water flows by gravity back to its source, passing out through pipe 16 where it is measured and recorded by a suitable instrument 17.

The air chamber 6 is of sufficient diameter and height to contain compressed air enough to afford a cushion whenever a reflex wave is occasioned by the sudden closing of hydrants or stop valves throughout the city.

The stand pipe 5 is primarily designed to hold the water pressure in the mains at a standard rate and although it is not intended as a reservoir, it acts to some extent as such.

With this apparatus it will be seen that all water pumped over the amount required to supply a city, is accounted for and the quantity of the overflow may be subtracted from the amount actually pumped, whereby the volume of water necessary to keep up the city demand can be reduced and made to conform more closely to the actual consumption of the city.

It will also be seen that leaks in certain mains may be easily repaired by shutting off the flow of water therefrom, without causing the pumping stations to shut down, as the overflow caused by shutting off one or two mains is not wasted, but returned to the source of supply and accounted for.

From the foregoing, it is believed that my invention may be clearly understood without further description, it being borne in mind that numerous changes may be made in the details of construction without departing from the spirit of the invention as disclosed in the following claims.

What I claim and desire to secure by Letters Patent is:—

1. An automatic water supply control, comprising a receiver in communication with a source of supply and discharging into a distributing main, a stand pipe connected to said receiver, an air chamber mounted on said receiver and in communication therewith and with said stand pipe, an overflow pipe adjacent said stand pipe, a plurality of connections between said stand pipe and overflow pipe, said overflow pipe being provided with a series of baffles and an outlet port, said port opening onto a series of steps, an overflow basin at the base of said steps, provided with an outlet, and means in said outlet for measuring the volume of water passing therethrough.

2. An automatic supply control for city water systems, comprising in combination, a receiver in communication with a source of supply and a distributing main, means for pumping water into said receiver, and means for measuring the water pumped, a stand pipe connected to said receiver for equalizing changes in quantities of water used by consumers, whereby a maximum head is stabilized, against which the supply pumps may operate, means for changing said head to conform to the demands at different times, an overflow for allowing the escape of excess water sent to the system by said supply pumps, means for returning said excess water to the source of supply, a meter for measuring the amount so returned, whereby the total amount actually consumed may be ascertained, and means for permitting the escape of air admitted to said system with the water.

3. The combination as claimed in claim 2, including an air chamber in connection with said receiver, for preventing shocks or water hammer caused by the sudden closing of large discharge openings in said system.

In testimony whereof I affix my signature.

JOHN ADAMS COLE.