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WATER SYSTEMS FOR COLORADO FARM HOMES

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In line with the progressiveness and efficiency of the age, labor-saving equipment and machinery of the latest type eliminate drudgery for the man on the farm. Unfortunately the same cannot be said for and of the farm woman. Too many farm homes are supplied with antiquated equipment, and back-breaking methods of household labor are still the rule and not the exception.

The most needed improvement in the average farm home is some form of running water, at least in the kitchen. Many women still lift and carry water equivalent to a ton a day, even as in Bible times. Some type of water in the home will reduce the women's burden more than the same money spent for anything else. It is also a great aid in bettering sanitary conditions and so reducing disease and generally improving the health of the whole family. Besides these features we have also to consider the comfort, pleasure and convenience that an adequate water system affords. Who needs a frequent bath more, or who would be refreshed more than the tired, dusty, sweaty farmer?

Colorado in 1920 stood seventh in the number of farms but twenty-fifth in the number of farm homes with water piped into them. Only one in fifteen reported this condition and many of these could scarcely be called running water even tho the arrangement was of great benefit.

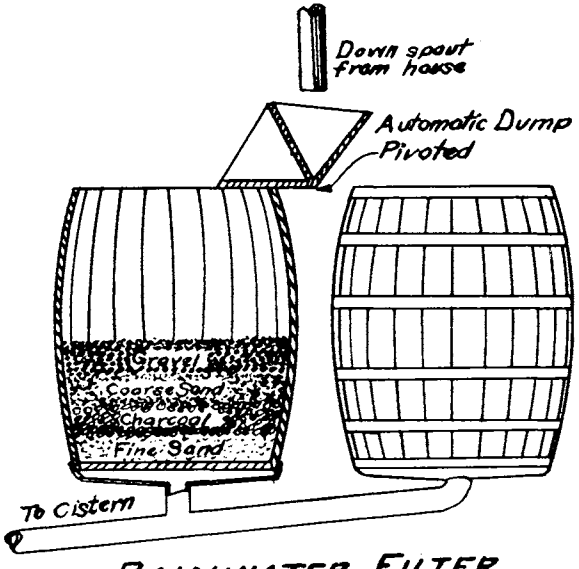
The preceding statements are not given in way of criticism but with the thought of encouraging more advancement along this line.

This bulletin will illustrate how different types of water systems can be installed, thus assisting the farmers and farmers' wives in a selection and installation suitable to their needs and purses. It is not intended that it shall be devoted to the art of plumbing. Few farmers are equipped with the necessary tools for this work, and those who are can secure bulletins on this subject. Ordinarily if the job is small it would not pay to purchase tools and if it is extensive they had best secure the assistance of someone skilled in this work.

Water Supply

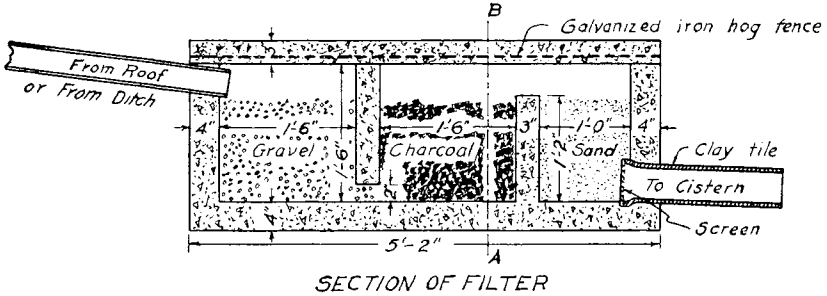
In the selection of a location for a farm home, if possible one should always select a location where an abundance of good water is available for the family and stock. This should be done both as a matter of convenience and as an improvement of great value to the farm. The water supply should be pure, abundant for all needs, and convenient.

To be pure the well, if shallow, should be located so that no underground polution from barnyard, outhouses, etc., can occur. All wells and cisterns should be covered and protected and filled in with earth around them so that no contamination from surface water, stock, etc., can enter. To do this concrete curbs and covers should be used, placed above the danger of surface water during heavy rains, and higher than corrals and barnyards. In the case of springs, they should be banked and drained, fenced and covered so as to protect them from polution.



RAINWATER FILTER

FIGURE 1



SECTION OF FILTER
WATER FILTER FOR
CISTERNS

FIGURE 2

Our wells are generally drilled and cased, driven or dug. Driven or dug wells are generally shallow and easy of polution both from surface and underground sources. The drilled and cased wells, when properly curbed, should be pure.

Cisterns are used exclusively in many sections of our state due to the hardness of the ground water or to the cost of wells where it is necessary to go to extreme depths. These cisterns are filled with water from adjacent towns, from wells at some distance or from ditches and rainwater. Where cisterns are used, unless the water is from city mains it is best to filter it to remove sediment or other matter which would otherwise enter. Two types of filters are shown

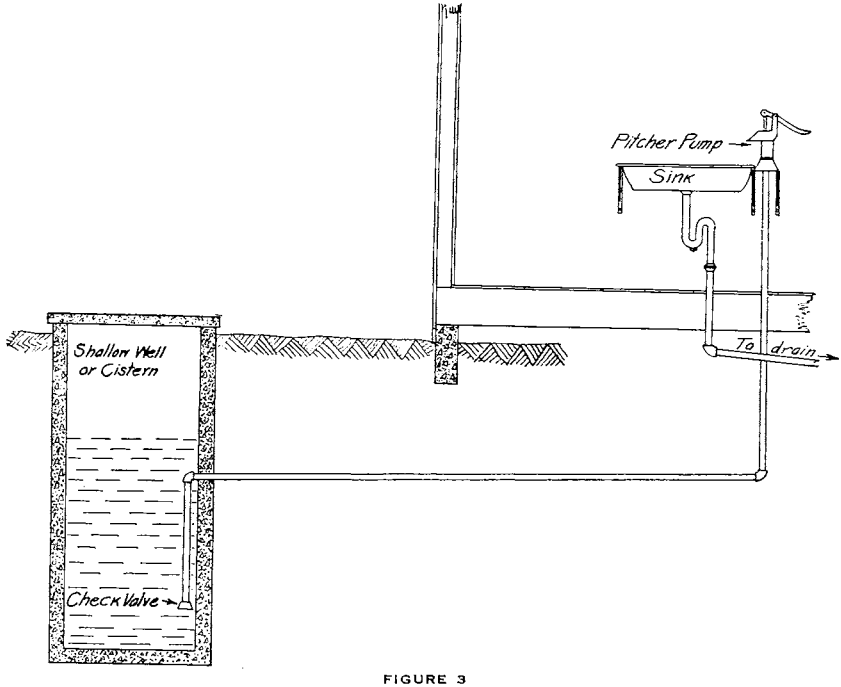


FIGURE 3

in Figures 1 and 2. Many types of filters are used with good results, but the principles and arrangements of sand, gravel and charcoal are similar.

Figure 1 is an ingenious method of using two water barrels to catch the run-off from the roof. The stream is alternated from one barrel to the other, thus giving double the filtering capacity.

Figure 2 represents one of the many types of filters for filtering rain water or other soil water used for filling cisterns.

Their use will prove an assistance in keeping the cistern clean and aid in keeping the water clear and healthful.

Pitcher Pump and Sink

The illustration in Figure 3 is that of the old-fashioned pitcher pump and sink.

This is one of the simplest types of systems for bringing water into the kitchen. It can be installed by any handy farmer and is especially adaptable to farms where a renter wishes this convenience and does not care to invest money in anything that cannot be taken away, should he move away. It is also a system that can be installed where money is scarce, as the total cost should not be over $15.00 or $20.00 where a nearby cistern is available, or where water is not over 15 feet to 20 feet below the pump.

Simple Hot-and-Cold Water Systems

In Figure 4 is shown a simple and cheaply constructed hot-and-cold water system that should also prove applicable to renters on

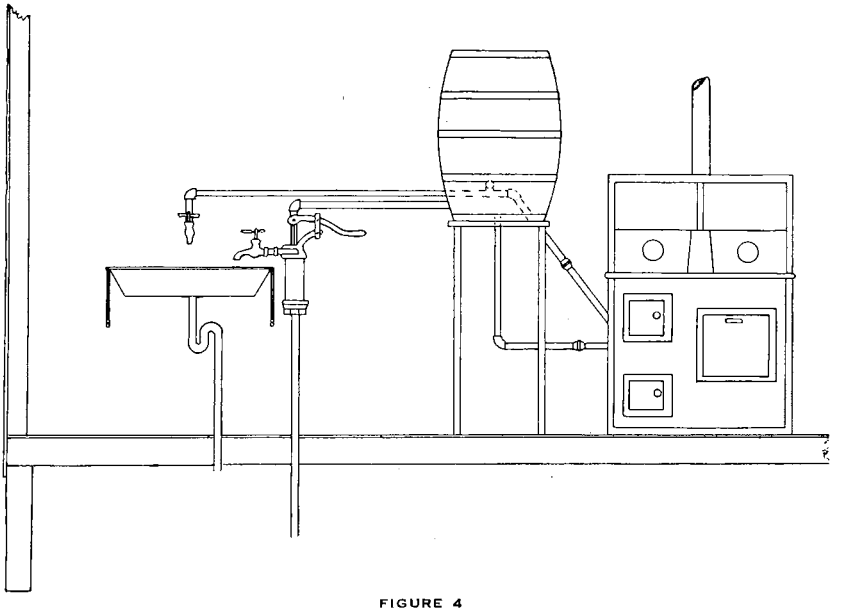


FIGURE 4

farms where money is scarce. It consists of a kitchen force pump, water barrel and water front or back placed in the range or cook stove. The water is pumped into the barrel when the pump faucet

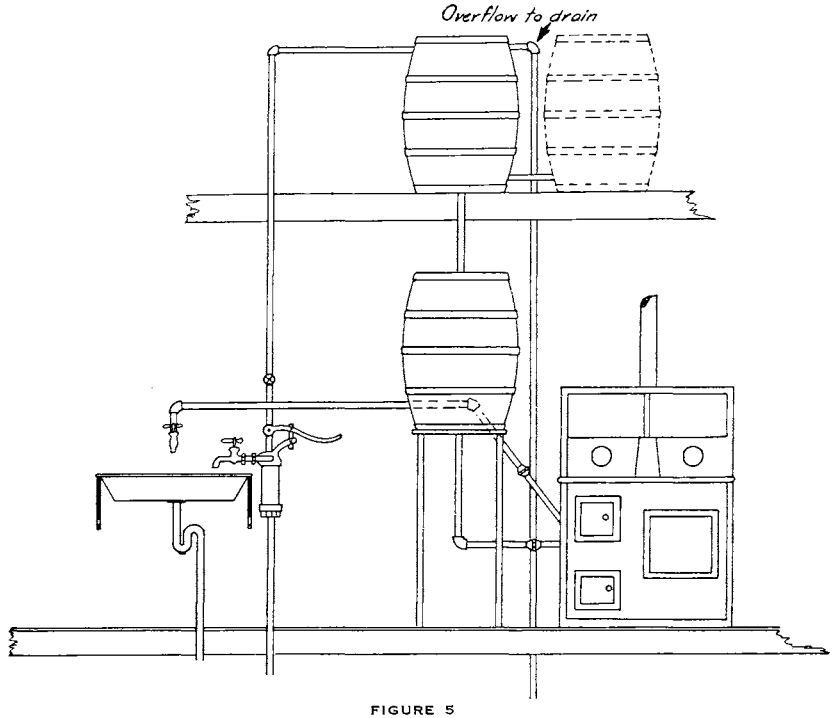


FIGURE 5

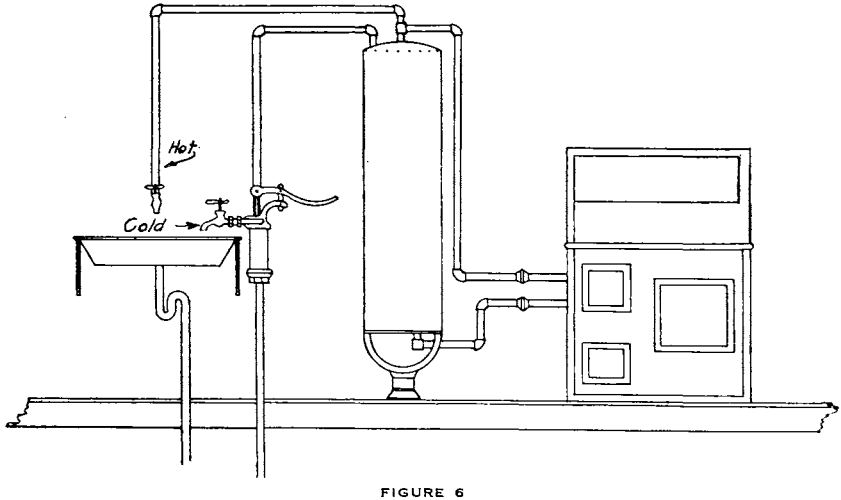


FIGURE 6

is closed. When fresh water is desired the faucet is opened and the pump operated. The barrel proves a cheap, efficient container and hot-water tank.

In Figure 5 one sees the same type of water system except that there is an additional storage provided in the attic over a partition for support. This storage can consist of one or more barrels connected across, as illustrated, or of a galvanized iron tank. These should be covered to keep out dust and dirt. They can be pumped full in the morning or evening, giving sufficient water for the day. Cold water can be drawn without pumping. If desired the water can be pumped from the well or windmill but it is more desirable to have fresh water available for drinking purposes at least.

What is believed to be the best cheap hot-and-cold water system is illustrated in Figure 6. This consists of a hot-water tank, kitchen force pump and sink. If fresh water is desired the pump faucet is opened and the water pumped from a shallow well or cistern. If hot water is desired the pump faucet is closed and the hot water faucet opened. As the cold water is pumped into the tank the hot water is forced out thru the hot-water pipe. The biggest disadvantage is that storage is not available, and hot water cannot be secured without pumping.

Gravity Systems

Where available a gravity pressure system is to be recommended. This may be secured by piping water from a stream or spring on higher ground, or by means of a windmill, gasoline engine or hydraulic ram. The water may be elevated to a tank such as illustrated in Figure 7, or to one placed on higher ground, if such is available and near at hand.

All pipes should be laid 3 to 4 feet under the ground to pre-

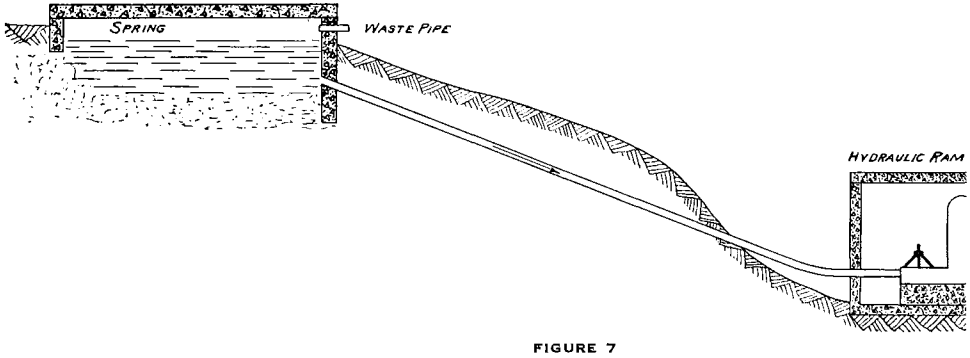


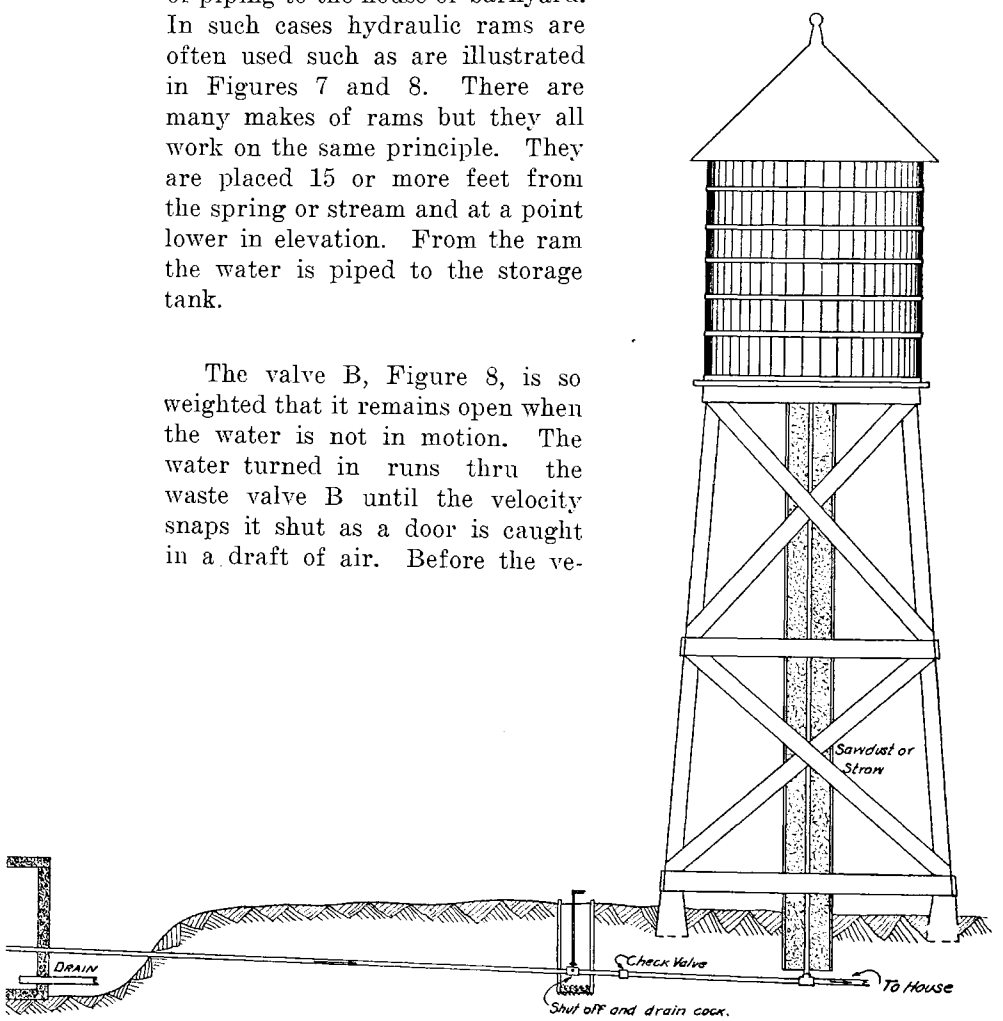
FIGURE 7

vent freezing, and the outlet pipe from an elevated tank should be protected by being boxed in and filled with sawdust, if possible. In high altitudes or cold regions, the tanks are sometimes enclosed to prevent freezing on the sides, but this is seldom needed if the water is being frequently added, thus keeping the temperature below the freezing point.

The Hydraulic Ram

In our mountain or hilly sections excellent spring water is frequently available but many times at too low an elevation to permit of piping to the house or barnyard. In such cases hydraulic rams are often used such as are illustrated in Figures 7 and 8. There are many makes of rams but they all work on the same principle. They are placed 15 or more feet from the spring or stream and at a point lower in elevation. From the ram the water is piped to the storage tank.

The valve B, Figure 8, is so weighted that it remains open when the water is not in motion. The water turned in runs thru the waste valve B until the velocity snaps it shut as a door is caught in a draft of air. Before the ve-



locity of the water is checked a small portion is forced by valve D. As the velocity of the water is then checked, the weighted valve B again opens and the water in the intake pipe is again put in motion. Thus the operation is continued over and over again. Valve E is used to let a little

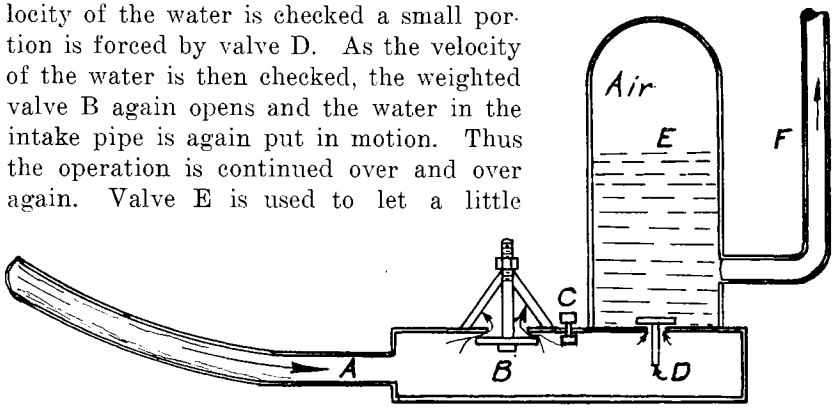


FIGURE 8

Action of the Hydraulic Ram

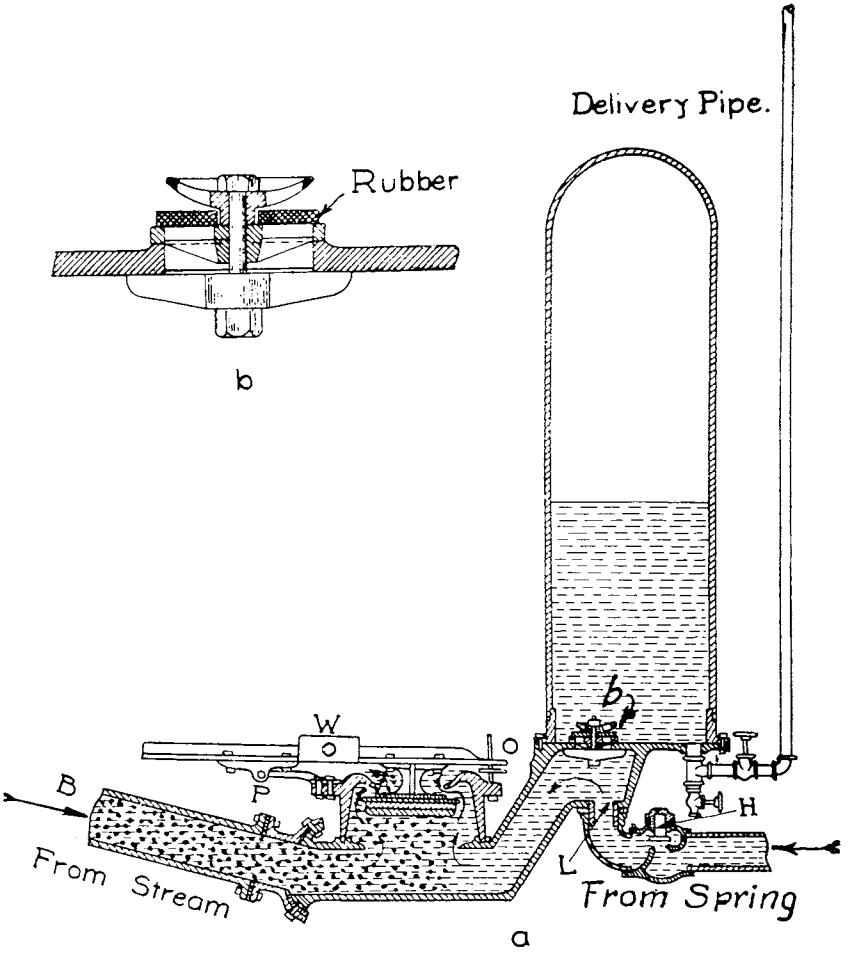
air in at each stroke or surge of the water. The air collects and is compressed in chamber E where it gives a continuous flow thru the discharge pipe F, instead of an intermittant one. Only one-seventh or less of the water in the intake pipe is elevated, the amount depending upon the drop in proportion to the lift.

Double-Acting Ram

In some cases only a small amount of pure, soft water is available from a spring, but there is a supply of other water at hand. In such a case one can install a double-acting ram such as is shown in Figure 9.

The ditch or creek water in pipe B is then used to elevate the spring water in pipe L, with little or no waste of the same and with none of the undesirable water being elevated.

Hydraulic rams can be secured from reliable plumbing supply houses at prices ranging from $15 upward, according to sizes, capacities and quality. With these are sent instructions as to installation, capacities, diameters and length of pipes, etc. These instructions should be closely followed to obtain the best results.



B—Supply pipe from stream
H—Check valve
L—Spring water supply pipe
O—Adjustable bolt
P—Pivot
W—Adjustable weight
(b)—Rubber covered waste valve

FIGURE 9

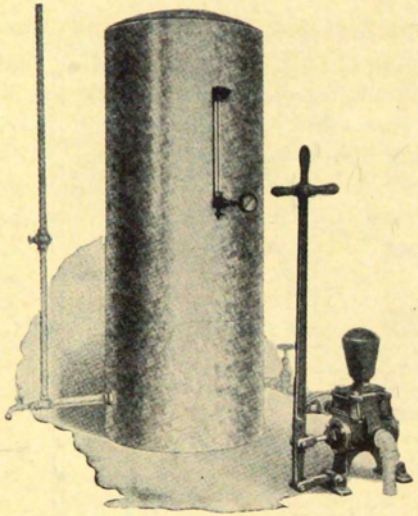


FIGURE 10
Pneumatic Water System

The pneumatic pressure system illustrated in Figure 10 is hand operated. The water is pumped in against air pressure. The air in the tank being compressed as the water rises in the tank. Where water is desired on tap at small expense and in limited quantities, these systems give good satisfaction. Pumps range from $15 upward, and tank, pump and connections cost from $65 to $85. The tank can be placed in the cellar where the water is kept cool. Similar systems are also installed in which a larger tank is used and the water is pumped in against the air pressure by being connected to the windmill or gasoline engine, which is attached to a force pump.

This gives a splendid pressure system but the strain on the windmill is objectionable if the pressure against which it pumps is excessive. A safety valve and pressure gauge must be installed to prevent dangerous compression. These plants require attention while the water is being pumped to prevent excessive pressure.

Figure 11 illustrates one of the many types of automatic water systems that are now on the market. Many of these are very satisfactory. The principle is simple, the construction is durable and they require scarcely any attention except oiling. These plants work similar to those just described except that the power is produced by an electric motor that operates either with 110 volts or a 32-volt battery system. When the water pressure drops below a certain minimum a connection is made and when it reaches a certain maximum it is automatically broken. These plants range in price from $85.00 upward to many hundreds, ac-

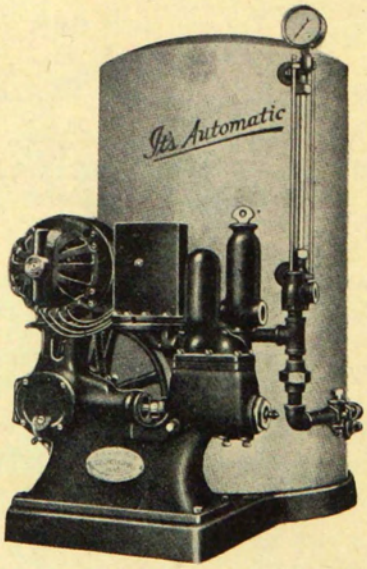


FIGURE 11

cording to the capacity per hour and the quality of the installation.

The system illustrated is for shallow wells and can be placed in the basement. Deep-well plants are more expensive and, while the

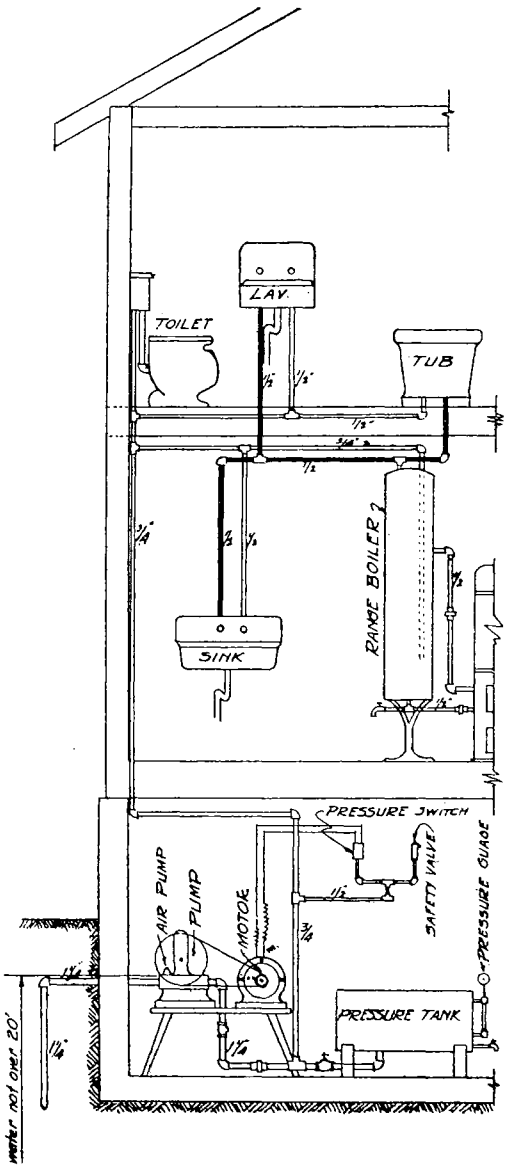


FIGURE 12

Water Connections

tank can be placed in the basement, the pump and motor must be placed directly over the well, so the cylinder is nearly at the bottom in or near the water.

While this bulletin is not intended as a treatise on plumbing, figures 12 and 13 show how water and sewer connections are made where all units are installed. Any water system requires an adequate sewer system and those interested should send to the Extension Service, Fort Collins, Colorado, for the bulletin on Septic Tanks for Sewage Disposal. A bulletin on Farm Plumbing is available also.

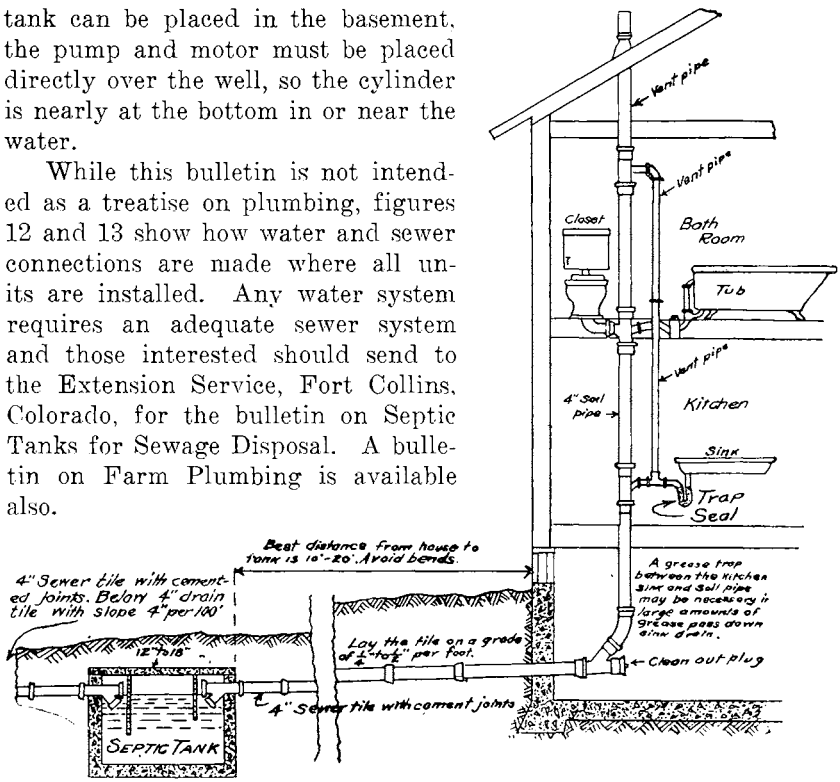


FIGURE 13

Sewage Connections