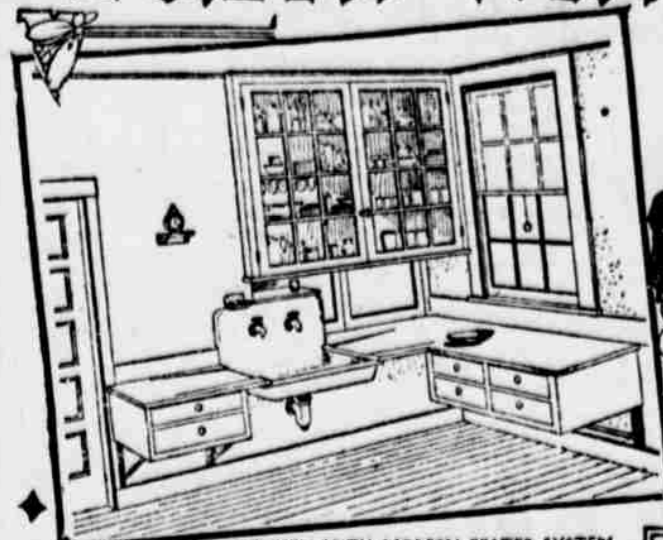
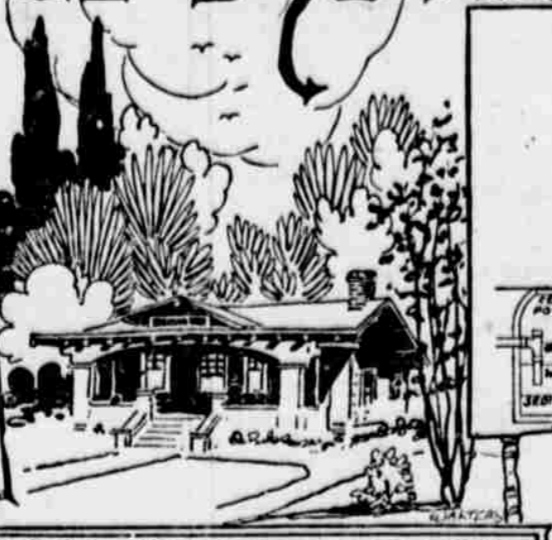


Bitter Waters and Sweet: Farm Water Systems



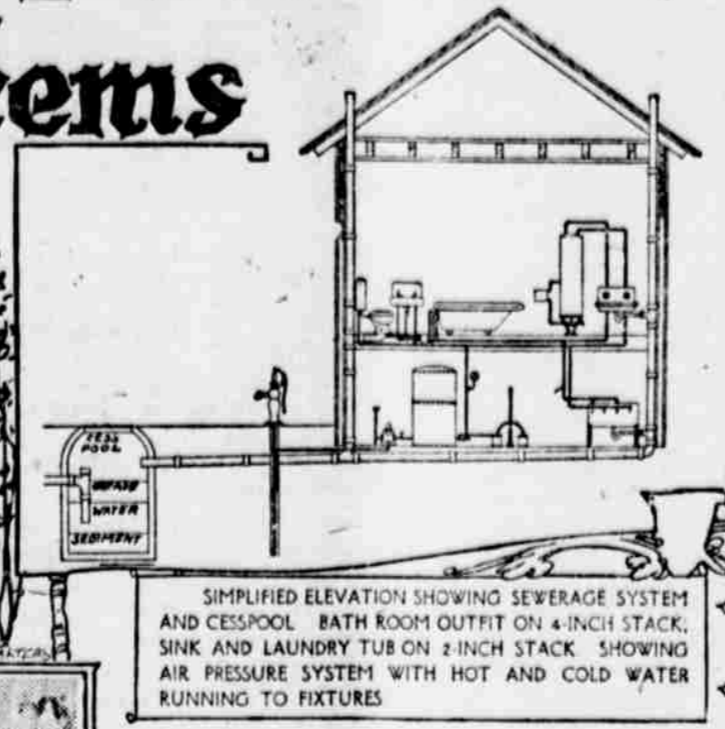
KITCHEN WITH MODERN WATER SYSTEM



MODEL BATH ROOM



DELIGHT OF THE FARMER'S WIFE



SIMPLIFIED ELEVATION SHOWING SEWERAGE SYSTEM AND CESSPOOL. BATH ROOM OUTFIT ON 4-INCH STACK, SINK AND LAUNDRY TUB ON 2-INCH STACK SHOWING AIR PRESSURE SYSTEM WITH HOT AND COLD WATER RUNNING TO FIXTURES



THE same truth applies to wells on the farm. The faculty that uses a well or spring subject to contamination is almost surely destined to taste the dregs of sorrow and suffering for having drunk its disease-laden output. Investigations made by the United States department of agriculture indicate that only a small minority of farm-water supplies can be classed as unqualifiedly safe and desirable. On the average three out of four farm wells are located within 75 feet of a back door of the house and in the direction of the barnyard.

That convenience and first cost, not safety, have been the deciding factors in such cases is made evident by the nearness of barnyards, pig pens, pastures, fertilized fields, sink drains, privies, cesspools, and areas rendered insanitary by chickens, sops, and other filth. Too frequently the seepage from these and other sources, after joining the ground water, moves to wells and springs, impairing the water supply by impurity, and may be grossly poisonous.

Wherever possible, the farmhouse should be fitted with some sort of running-water system, simple or elaborate, according to the investment the owner is able to make. For such systems water may be raised by natural flow, hydraulic rams, pumps, air lifts, or air-displacement pumps. Hydraulic rams are the most economical water-lifting devices. Since rams of various sizes and makes perform differently, it is usually necessary to accept the mechanical details determined by the manufacturer. The minimum, never more than the average, flow of the spring should determine the size of the ram. Otherwise, the one selected may be too large for the dry-weather flow. Small flows may be determined by noting the time required to fill a vessel of known capacity. Larger flows may be determined by weir measurements.

When the water supply is far from the ram site, it is usual to pipe the flow to an open tank or reservoir located so as to secure the desired length and fall of drive pipe. Sometimes the flow of a spring is too small to actuate a ram that is sufficient for domestic requirements. In such instances and where a nearby brook can be dammed to obtain the necessary power head, the recoil of the ram may be employed to admit the spring water, which is pumped by a fall of the brook water to the pipe drive.

Motion of water produces friction, which increases with the length and roughness of the pipe and the rapidity of the water's movement. Hence, wherever much water is to be delivered through a long pipe the power or head necessary to overcome friction should be determined. The bulletin mentioned before (Farmers' Bulletin No. 941) contains a table which shows the friction head; that is, the number of feet to be added to the vertical height for each 100 feet of iron pipe (not new) to overcome friction when discharging given quantities of water.

In the selection of a pump one should determine the kind of well to be used, its inside diameter, depth to the bottom, the depth gaged, depth to the water level, both when the pump is at rest and in operation, and the maximum yield. The maximum quantity of water required per day should be calculated also. One should also determine the distance from the well to the proposed location of the pump and the vertical height between these points; likewise the distance from the pump to the reservoir or tank and the vertical height between these points. The kind of power to be employed should be settled upon also—hand power, windmill, gasoline or oil engines, or electric motors—and the method of transmitting the power.

Farm pumps usually are of the suction, lift, force, deep-well type or some combination of these. Suction and lift pumps do not raise water above the pump nor discharge it under pressure. Suction pumps require the cylinder to be above the water level of the supply. If a perfect vacuum could be created within the cylinder water could be raised vertically by suction 33.9 feet at sea level. However, the actual suction lift is usually not more than two-thirds of the theoretical lift. Methods of making tight joints are described in the bulletin referred to.

Horizontal suction pipes may extend long distances, providing the friction loss plus the vertical height from the water level to pump valve does not exceed the limiting suction lift. Where

derground water is without merit, although "forked-stick" artists from experience often are better able to judge the probabilities of ground water than the average person.

Various Kinds of Wells.

Wells are spoken of as shallow or deep, dug, bored, driven, or drilled, and in the case of tubular wells, as nonflowing, flowing, or artesian. Persons interested in the various types of wells and their construction, advantages, disadvantages, etc., will find the subject treated in Farmers' Bulletin No. 941.

The chief advantage of air-displacement pumps is that water may be taken from ordinary depth or lateral distance, or from several sources, with one power outfit and delivered direct from the well to the faucet. The power plant may be located wherever convenient and as many pumps may be used as there are sources of water. Both hard and soft water may be delivered by using two pumps and the necessary piping systems. Air-displacement pumps are not adapted at present to lifts much over 125 feet or to wells less than three inches in diameter, nor can they be used where more water is required than the well can supply within a specified period. Air pipes and air-displacement pumps must be tight and remain tight in service, and working parts must be kept in good order.

Water may be raised by hand, windmill, hydraulic rams, steam, hot air, gas, internal-combustion engines, or electric motors. Hand power is unsuited to large supplies or high lifts. Windmills are probably the most familiar type of mechanical power used, and often are arranged to start and stop automatically. Gasoline and oil engines are well adapted to farm pumping, and may be equipped to stop at any desired pressure in a supply tank. The use of electricity for pumping is increasing. The method is clean, quiet, and convenient, and starting or stopping a distant pump by throwing a switch may be practical wherever transmission lines are sufficiently near.

The theoretical horsepower needed to raise water is found by multiplying the gallons pumped in one minute by the total lift, in feet, including friction in both suction and discharge pipes, and then dividing the product by 4,000. The horsepower, as computed, should be multiplied by from two to four to overcome losses in pumping and still allow for a reserve of power. Ordinarily one to two horsepower engines are sufficient for farm pumps, but it is always safest to determine this point by computation.

An advantage to be derived from the well-installed farm water system often overlooked is the benefit it affords in the way of fire prevention. With relatively small expenditure, fixtures can be added to a pipe system, which give ready access to the water supply for fighting flames. In almost every case a fire can be easily put out if discovered at its early stage, providing there is fire-fighting apparatus near by, and all hands, even the children, are taught and drilled to use such apparatus coolly and skillfully.

Perhaps the greatest value of concrete, however, is the fact that it can be mixed by the farmer himself. Instead of having to depend upon expensive masons and carpenters he can employ his spare time in concrete construction, because concrete work is something that anyone can learn with a little practice.

a pump cannot be placed so that the limiting suction lift will not be exceeded. It is necessary to lower the pump cylinder into the well, raising the water from the cylinder to the spout by the direct lift of the piston. Water can be pushed more easily than it can be pulled, hence, rather than resort to extreme suction lifts it is preferable to lower the cylinder to within 15 feet or less of the supply, or still better to submerge it.

Where water is discharged against pressure a force pump is necessary. A practical installation for the kitchen sink is a combined suction and force pump which will be found a great labor saver for the housewife.

Deep-Well Pumps.

Deep-well pumps are heavier and stronger than those described above. They may be of the lift or force type and the standard or working head is always directly over the well. The cylinder should be near (within 15 feet) or else below water level which pumping and drought may create. Submergence is the preferable arrangement. In all installations the size of the pumping cylinder must be determined from the size, depth, and yielding power of the well, the quantity of water required, and the available power. Deep wells and hand or windmill outfits take small cylinders.

Pumping by means of compressed air is very old, but the systems used prior to 1900 required the air supply to be turned on or shut off according to whether or not the water was needed. Based on a patent granted in that year, a two-cylinder air-displacement pump submerged in the water supply and controlled by the opening and closing of the faucet, was devised. The essential parts of installation, besides such a pump, are an air compressor, storage tank, engine or motor—with air and water pipes, and minor attachments. The pump operates only when water is used, starting whenever a faucet is opened and continuing until all faucets are closed.

San Francisco Woman Kept Lamp in Window to Reclaim Wandering Husband.

San Francisco.—Each night for ten long years a light glowed in the window of Mrs. Adeline Fields' home in this city, to guide the footsteps of her wandering husband, William F. Fields. But Fields never returned. Then, one morning, Mrs. Fields blew out the light and went downtown to the office of a lawyer, where she applied for a divorce. "I married William Fields in September, 1909," she told the lawyer, "and he left soon afterward. For ten years I have been waiting for him to return and have written numberless letters. Each night during those ten years I have kept a light burning in the front window for him. But I have decided at last that I have been deserted and I want a divorce." Judge Graham granted her a divorce.

TEXAS THIEF PUTS UP NOVEL DEFENSE

Woman Alleges That She Stole Only When Hypnotized by Mate.

Dallas, Tex.—Attorney for Mrs. Madeline Tether, pretty 22-year-old brunette, of this city, charged with stealing patent rights valued at more than \$100,000, insists the woman is innocent of any crime because she acted under the hypnotic influence of her husband. In support of the claims made by her attorneys, Mrs. Tether was taken to the office of District Attorney William J. Pierson, where she was hypnotized and where she performed a number of seemingly impossible acts. Health physicians who witnessed the demonstrations jabbed her with needles and made other tests which proved her trance was not a fraud.

It is the first time in the South that such a plea has been entered in any criminal case, and as a result attorneys and jurists are watching the outcome with interest.

According to Noah Roark, one of Mrs. Tether's attorneys, she was un-



Hypnotizing His Wife.

der a hypnotic spell when she was married three years ago. At times after the marriage her husband would throw his wife into a trance and allow her to lie for days at a time while he was absent from home. He did not want her to speak to another man or have anything to do with neighbors or any one other than himself.

It is alleged that Tether knew the place where the drawings desired were concealed and that, after hypnotizing his wife, he commanded her to go and get the drawings. She obeyed, but, it is alleged, only did as commanded and therefore cannot be punished for the crime.

WAITED TEN YEARS IN VAIN

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Gypsy Girl, 14 Years Old, Has Been Wed 12 Times

Although only fourteen years old, Rosa Marks, gypsy, has been married 12 times, she told the police at Omaha, Neb. Each time her father collected "compensation" and then secured her release through the courts because of her tender years.

FOUGHT DUEL FOR WOMAN

One Man Left Dying on Mountain in New Jersey, the Victim a Fugitive.

Jersey City.—In one of the loneliest spots at Garrett mountain, N. J., two Italians fought a duel for the affections of a pretty Italian girl. One of the duelists was killed and the other is a fugitive.

The young woman, Frances Genarro, 26, is under arrest as a material witness. She admits, the police say, that Salvatore Noble, a former service man, and Salvatore Guerrieri were rivals for her hand, and agreed to settle the question with knives.

Noble, his heart pierced by the knife of his rival, was found dead on the mountain the following day.

NERVOUS PROSTRATION

Mrs. J. Christman Proved That Lydia E. Pinkham's Vegetable Compound is a Remedy for this Trouble.

Binghamton, N. Y.—"I was in a very nervous condition for over a year, my mind was gloomy, I could see no light on anything, could not work and could not have anyone to see me. Doctor's medicine did not help me and Lydia E. Pinkham's Vegetable Compound was recommended. I took it and a new well. I recommend it to all afflicted with nervous prostration."—Mrs. J. CHRISTMAN, 133 Oak Street, Binghamton, New York.

The success of Lydia E. Pinkham's Vegetable Compound, made from roots and herbs, is unparalleled. It may be used with perfect confidence by women who suffer from nervous prostration, displacements, inflammation, ulceration, irregularities, periodic pains, backache, bearing-down feeling, flatulency, indigestion and dizziness. Lydia E. Pinkham's Vegetable Compound is the standard remedy for female ills.

If there are any complications about which you need advice write in confidence to Lydia E. Pinkham Medicine Co., Lynn, Mass.

SQUEEZED TO DEATH

When the body begins to stiffen and movement becomes painful it is usually an indication that the kidneys are out of order. Keep these organs healthy by taking

GOLD MEDAL TABLET OIL CAPSULES

The world's standard remedy for kidney, liver, bladder and uric acid troubles. Famous since 1896. Take regularly and keep in good health. In three sizes. All druggists. Guaranteed as represented. Look for the name Gold Medal on every box and accept no imitation.

Her "Sorrow Clothes." Mary Ellen had just finished dressing a clothespin in black for Halloween and she said, "That clothespin has lost her husband and has on her sorrow clothes."

GREEN'S AUGUST FLOWER

Constipation invites other troubles which come speedily unless quickly checked and overcome by Green's August Flower which is a gentle laxative, regulates digestion both in stomach and intestines, cleans and sweetens the stomach and alimentary canal, stimulates the liver to secrete the bile and impurities from the blood. It is a sovereign remedy used in many thousands of households all over the civilized world for more than half a century by those who have suffered with indigestion, nervous dyspepsia, sluggish liver, coming up of food, palpitation, constipation and other intestinal troubles. Sold by druggists and dealers everywhere. Try a bottle, take no substitute.—Adv.

Her Own. "Was she self-possessed when you proposed to her?" "Yes, and—she is yet."

Don't Forget Cuticura Talcum. When adding to your toilet requisites. An exquisitely scented face, skin, baby and dusting powder and perfume, rendering other perfumes superfluous. You may rely on it because one of the Cuticura Trio (Soap, Ointment and Talcum). 25c each everywhere.—Adv.

A man should have plenty of backbone for himself—and plenty of backbone for the rest of the family.

Watch Your Kidneys!

That "bad back" is probably due to weak kidneys. It shows in a dull, throbbing backache, or sharp twinges when stooping. You have headaches, too, dizzy spells, a tired nervous feeling and irregular kidney action. Don't neglect it—there is danger of dropsy, gravel or Bright's disease! Use Doan's Kidney Pills. Thousands have saved themselves more serious ailments by the timely use of Doan's. Ask Your Neighbor!

A Nebraska Case

John A. Lee, 310 S. Seventeenth St., Omaha, Neb., says: "My kidneys were disordered and the secretion contained sediment. I think exposure to all kinds of weather caused my kidney trouble. My back, at times, became very painful. Every change of the weather seemed to bring on rheumatic pains through my hips, knees and my ankles would swell. I read of Doan's Kidney Pills and decided to try them. After taking three boxes of Doan's my trouble left me entirely." Get Doan's at Any Store, 60c a Box DOAN'S KIDNEY PILLS POSTER-MILBURN CO., BUFFALO, N. Y.

A Bad Cough

If neglected, often leads to serious trouble. Safeguard your health, relieve your distress and soothe your irritated throat by taking

PISO'S