SIMPLIFIED ELEVATION SHOWING SEWERACE SYSTEM

a pump cannot be placed so that the limiting

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 cre-

continuing until all faucets are closed.

two pumps and the necessary piping systems.

and remain tight in service, and working par-

Horsepower Needed.

Water may be raised by hand, windmill, he

draulic rams, steam, hot air, gas, internal-com-

bustion engines, or electric motors. Hand power

is unsuited to large supplies or high lifts. Wind

mills are probably the most familiar type of me-

chanical 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 prac-

tical wherever transmission lines are sufficiently

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 boose-

power, 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

discovered at its early stage, providing there 's

fire-fighting apparatus near by, and all han's.

even the children, are faught and drilled to u-e

CONCRETE ON THE FARM.

that has aided the farmer in making his farm-

stend more attractive, his live stock more com-

fortable and his farm more valuable, it is con-

crete on the farm. It is one of the most eco-

nomical and suitable farm-building materials. In

permanency it cannot be surpassed. In fact, it

is unequaled in this one respect. Concrete

to the farmers' grain bins and corncribs, but the

Perhaps the greatest value of concrete, how

ever, is the fact that it can be mixed by the farm-

er 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.

ly reduced the damage done to stored grains.

If there is any one thing more than another

such apparatus coolly and skillfully.

this point by computation.

must be kept in good order.

Air-displacement pumps are not adapted at pres-

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

bor saver for the housewife.

small cylinders.

# Bitter Waters and Sweet: Farm Water Systems STITCHEN WITH MODERN WATER SYSTEM MODEL BATH ROOM. DELIGHT OF THE FARMER'S WIFE (Prepared by the United States Depart-ment of Agriculture.) HERE is Scriptural authority for the statement that bitter waters and sweet do not flow from the same fountain. The same truth applies to wells on the farm. The family 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 aver-

age three out of four farm wells are located with-

in 75 feet of a back door of the house and in

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, priv-

ies, cesspools, and areas rendered insanitary by

chickens, slops, 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,

Sewage Disposal.

of sewage has existed so long and so universally

that only within comparatively recent years has

it been realized that this waste product of hu-

man life is poisonous and must be kept from the

food and drink of man. From the specific germs

or polson that may be carried in sewage at any

time there may result typhoid fever, tuberculo-

sis, hookworm disease, cholera, dysentery, diar-

rhea, or other ailments, and it is not improbable

that certain obscure maladies may be traced event-

ually to the poisonous effects of drainage from hu-

man waste. The poison is invisible to the naked

eye, and it may be carried by many agencies, by

devious routes, and be unsuspectingly received

into the human body. Typhold fever is peculiarly

cate serious neglect of responsibility with regard

to sanitation by people who live in the country.

sance, but not to dispose of sewage cleanly and

completely invites disease. It is not enough that

human filth is taken 50, 75, 100, or 150 feet

away from a well or spring, or that it is

taken merely to lower ground. Given loose or

open subsoll, seamy ledge, or long-continued pollu-

tion of one plat of ground, the zone of contamina-

tion is likely to extend and readily may reach

quite distant wells, especially at such times as

well waters are lowered by drought or heavy

pumping. Whatever the system of sewage dis-

posal, it should be entirely and widely sepa-

rated from the water supply, and, if possible,

the surface of the sewage in any leaky privy.

vault or cesspool should be lower than the low-

est water in any near-by well. The United

States department of agriculture has prepared

bulletin No. 712, from its 1916 Yearbook, enti-

tled "Sewage Disposal on the Farm," which gives

details regarding various types of outhouses, sug-

gestions regarding plumbing, cesspools, septic

tanks, and related subjects. This pamphlet will

Pure Water the Need.

can farms is pure water supply. From the

standpoint of the housewife, second only in im-

portance to purity, is the installation of a water

a well if the sources which feed it are permanent-

ly at fault. Wells cannot be located in all cases

to be wholly free from pollution, but the great-

est safeguards are clean ground, and as wide sep-

arations as possible from the probable chanuels

Water for domestic use should be clean, lus-

trous, odoriess, coloriess, wholesome, soft, neither

strongly acid nor alkaline, and its temperature

for general farm purposes should be about 50 de-

grees. These characteristics, however, are never

proof of parity, for a glass of water may pos-

sess them all and yet contain millions of disease-

Ground water is the ideal supply for the

farm. Any farmer who is about to have a deep

well, and who is uncertain of the depth and quan-

tity or quality of the water likely to be encoun-

tered, should describe fally the location and cou-

dition of his project to national or state geologi-

cal authorities and ask for advice. The use of

the willow, hazel, or peach stick for locating un-

Continued pumping will not improve water in

system in the farm house that will save labor.

One of the first and obvious needs of Ameri-

be mailed free on request.

of impure drainage.

producing germs.

Not to dispose of sewage promptly invites nul-

a rural disease, and many instances clearly indi-

Popular indifference to the effective disposal

the direction of the barnyard.

and may be grossly poisonous

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' Builetin No. 941.

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 pureps, Hydraulic rams are the most economical waterlifting devices. Since rams of various sizes and makes perform differently, it usually is necessory 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 welr

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 plpe. 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 full 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.

Selection of Pump.

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 cased, 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 off 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 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 builetin 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

(Conducted by National Council Boy Scouts of America.)

### SCOUTS EMBODY BEST IDEALS

"During my four years in Germany," says James W. Gerard, former American ambassador, "I saw much of the child life of that country. The children were paraded through the streets singing their songs of hate. In the schools they were thought a deliberate perversion of history. For instance: The Fathertand did not wish to injure the Belgians, but the wicked Belgians promised to allow our troops to poss through their country and then attacked them.'

How different are the methods that are used to bring out the best in the childhood of this, our own country! While the Germans had organization suction lift will not be exceeded, it is necessary, which were intended to develop hatred to lower the pump cylinder into the well, raising and like passions in the hearts of the the water from the cylinder to the spout by the young, we have the Bo. Scouts of direct lift of the piston. Water can be pushed America. This splendid organization more easily than it can be pulled, hence, rather well illustrates the difference in ideals than resort to extreme suction lifts it is preferbetween the two countries. In the able to lower the cylinder to within 15 feet or Boy Scouts the boy subscribes to an less of the supply, or still better to submerge it outh to be true to himself and his Where water is discharged against pressure a country and to keep himself morally force pump is necessary. A practical installation for the kitchen sink is a combined suction and physically fit at all times. He also and force pump which will be found a great 'a- pledges himself to "do a good turn daily.

> The boy is taught woodcraft and many other useful things. He participates in big public functions and civic ceremonials. From the very first he is led into the higher citizenship.

### PRISONERS AID SCOUT PLAN.

ate. Submergence is the preferable arrange-Through the gray of the granite ment. In all installations the size of the pumpwalls that shut away the inmates of ing cylinder must be determined from the size. the Minnesota state prison from the depth, and yielding power of the well, the quanrest of the world came this little story tity of water required, and the available power. which shows that "stone walls do Deep wells and hand or windwill outfits take not a prison make nor iren bars 2

Pumping by means of compressed air is very In the office of George D. Pratt old, but the systems used prior to 1909 required treasurer of the National Council, the air supply to be turned on or shut off accord-Boy Scouts of America, New York, a ing to whether or not the water was needed letter arrived from Stillwater-a let-Based on a patent granted in that year, a two- ter containing \$28.50, "in payment of cylinder air-displacement pump submerged in the the following applications for associwater supply and controlled by the opening and are membership in the National Counclosing of the faucet, was devised. The essen- cil of the Boy Scouts of America."

tal parts of installation, besides such a pump Daniel Blue, Frank Meyers, Joseph are an air compressor, storage tank, engine or mo-Kelly, Charles Kramer, J. W. Schwartz. tor-with air and water pipes, and minor attach- George Olson, Jacob Red Bird, N. A. ments. The pump operates only when water is Burke, August Ruther-all prisoners,

used, starting whenever a faucet is opened and Far removed from the blue skies and running streams and long, winding The chief advantage of air-displacement pumps roads that perhaps they themselves is that water may be taken from ordinary depth had trod in their boyhood, they looked or lateral distance, or from several sources, with back through the years, at the whatone power outfit and delivered direct from the might-have-been, at the different lives well to the faucet. The power plant may be they might have led had they been located wherever convenient and as many pumps shown differently, and "came across" may be used as there are sources of water. Both that other boys might have a fighting hard and soft water may be delivered by using chance.

### SCOUTS URGE AMERICANIZATION.

ent to lifts much over 125 feet or to wells 'ess than three inches in diameter, nor can they be The executive board of the Boy Scouts of America has decided to used where more water is required than the well can supply within a specified period. Air strengthen its program for citizenship pipes and air-displacement pumps must be tight training in order that even a greater emphasis than before would be placed upon developing patriotism and Ameri-

It was also agreed that special effort would be made to develop a program for older boys, affording them an opportunity to "learn by doing." in preparing for citizenship responsibilities.

The executive board meeting was attended by Messrs, Waiter W. Hend, of Omaha: John M. Phillips, of Pitts burgh; George D. Porter, of Philadelphia: Alfred W. Dater, of Stamford; Hon. James J. Storrow, of Boston; Charles P. Neill and Colin H. Livingstone, of Washington, D. C.; Mr. Daniel Carter Beard, of Flushing; John Sherman Hoyt, George D. Pratt, Lieut, Col. Theodore Roosevelt, Jeremiah W. Jenks and James E. West. of New York City.

Mortimer L. Schiff was selected as the representative of the Boy Scouts of America on the International Scout committee.

## SPOKANE SCOUTS AS FIREMEN.

An advantage to be derived from the well-in-At a meeting of the fire prevention and fire insurance committee of the stalled farm water system often overlooked is the benefit it affords in the way of fire prevention. chamber of commerce in Spokane. With relatively small expenditure, fixtures can be Wash., it was decided to perfect a peradded to a pipe system, which give ready access manent organization to be known as to the water supply for fighting flames. In althe Spokane Scout Firemen. most every case a fire can be easily put out if

The organization will consist of Boy Scouts who have passed certain examinations on fire prevention. Fire .Chief A. L. Weeks will be ex-officio chief of the organization.

ample and incentive on his visit to other states and towns in the state, muid. Moreover, outs straw contains He had slides made of the Spokane quite a large amount of plantfood, esscort fire exercises to induce other pecially poinsh. cities to follow Spokane's lead.

## SCOUTS TO HAVE MOTOR CORPS.

niso one of the biggest factors in making build-The council of the Boy Scouts of ings rat and mouse proof. Needless to say rats America in Westchester county, New and mice have always been a constant menace York, is making extensive plans for the development of an efficient county widespread use of concrete on the farm has great boy scouts motor corps.

Applications are being received at county headquarters from older boy scouts who have autos which can be of service for emergency calls,

As soon as the corps is efficiently organized, its services will be at the disposal of all legitimate organizations and other kood causes.

## TINY SCOUT IS ON THE JOB.

The Boy Scouts of Troop No. 1 of Elizabethtown, Pa., Scoutmaster C. M. Heistand, are very proud of the record of Roy T-eichler, aged 12, the smallest boy in the troop.

While he camp with the troop he tore a hole in the calf of his leg on a natl. He never cried and wanted to administer first aid to himself, but was transported seven miles to a doctor, All that he said was, "The worst pain is that I cannot go back to camp with you."

## BLACK LOCUST RECOMMENDED FOR WOODLOT



Black Locust Plantation, Trees Five Years Old.

Prepared by the United States Depart | out field in middle Tennessee which,

ment of Agriculture.) Black locust-known also as "yel- with one-year-old locust seedlings,

20 years previously, had been planted locust-is one of the most profit- yielded fence posts worth \$188 an acre able and useful kinds of timber for the on the stump, or \$480 at the railroad farm. The wood is heavy, hard, and about two miles distant. This was a particularly durable when used in the gross return of \$9.40 an acre yearly on ground. For use as fence posts, black a hillside of fairly good soil which belocust is long-lived and very desirable. fore the trees were set out had started Only one other wood gives longer serv- to gully badly. Returns of 85 to \$7 an ce, namely, osage orange or "bois acre annually have frequently been realized on poor, thin hill land. Good solls underlaid with limestone and planted to black locust in the Appalachian and Pledmont regions, from Pennsylvania to Kentucky and Tennessee, can be counted on to yield an average of \$10 an acre yearly at the end of from 15 to 20 years.

The manufacture of insulator pins requires large amounts of plack locust, for which purpose it is the most satisfactory wood.

Starting Black Locust. In storting black locust, small

sprouts with a portion of the root may he dug up and used; or, better, the seed may be sown in the spring in drills in good soil, like onion seed. At the end of the season the seedlings will be from two to four feet in height and satisfactory in size for setting out. This may be done in the late fall, but the spring season, about the time growth starts, is preferable. In some regions the locust wood borer is almost certain to cause extensive damage to young plantations unless special precautions are taken to keep the trees in a healthy growing condition and the bark shaded by follage, either from near-by trees, shrubs, or weeds, Information on this insect and methods of its control will be found in United States Department of Agriculture Bulletin 787, "Protection From the Locust curs in abundance and is so hard that Borer."

Strange as it may appear, black locust, although one of the most durable woods when set in the ground, Block locust grows rapidly and matures early and deteriorates in the yields good-sized fence posts at an age | tree rapidly if not cut when ripe. Comof from fourteen to twenty years, ac- mercially the tree is usually mature in cording to the forest service. A worn- 15 to 25 years.

# GOOD TOP DRESS FOR WHEAT | FEEDING HAY AND ROUGHAGE

Black Locust Utilizing Rocky Places

d'arc." which, however, nowhere oc-

it is difficult to drive staples into it ex-

Locust Grows Rapidly.

Farm Management.

cept when it is green.

on Farm Are Indications of Good

Application of as Little as Two Tons of Manure Per Acre May Increase Yield Ten Bushels.

wheat with manure. An application of as little as two tons per acre may increase the yield ten bushels; at least it has done this much one year with another in Indiana tests. Four tons make only about two bushels more, The manure benefits the wheat directly through the plantfood which it

contains, and indirectly through the winter protection, which often is of greater value. Where manure is used as a top dressing the stand of clover is generally better. There is an or- HOW WHEAT IS DISPOSED OF ganic benefit from the manure which is considerable and is not so easily explained. Where as much or more plantfood is applied in the form of commercial fertilizers the resulting yield has not been as large.

## CUT STRAW IS BEST BEDDING

Much of Liquid Manure, Now Wasted, Can Be Saved by Use of Effective Absorbents.

A great deal of the liquid manure now going to waste can be saved by the use of absorbents, such as straw, sawdust, muck and loam. Uncut Deputy State Fire Marshal Groce straw is a very valuable absorbent. NICE INCOMES FROM POULTRY stated at the meeting that he cited the taking up two or three times its weight boy scout fire organization as an ex- of water, while fine cut straw will absorb six or nine times its weight of

Time and Money Can Be Saved by Making Purchase on One Order-Give Systematic Care.

(Prepared by the United States Depart- ESSENTIAL FOR EGG SHELLS

If possible all small tools for the Limestone Grit, Oyster Shells or farm should be purchased on one order. This will save time and, usually, money. Also, it will entall a total expenditure sufficiently large to impress the farmer with the importance of tirely of lime. The bone of the fowl giving systematic care to his small contains considerable lime, and also

One Established by Department of Agriculture in Wyoming Is the Only One of Its Kind.

The stallion farm established by the United States department of agriculture in co-operation with the Wrom ing Agricultural college at Buffelo, Wyo., July 1, is the only one of its breeding stution.

Handling and Hauling of Large Bulk May Be Saved by Giving Products

to Live Stock.

It pays a big profit to top dress the Prepared by the United States Department of Agriculture.) In the marketing of hay and roughage there is a large bulk to handle and haul to the point of delivery. The United States department of agriculture points out that this means much extra labor for the men and teams on grain and crop farms, and much fertility is taken off which might be returned to the fields if the products

were fed to live stock.

One-Half of Crop of 1918 Sold by Farmers in Three Months Beginning With July.

(Prepared by the United States Depart-ment of Agriculture.)

Wheat is mostly marketed by farmers soon, or, at any rate, not long, after the harvest. Of the crop of 1918, more than one-half was sold by farmers in the three months beginning with July, and 69.3 per cent in four months. Thereafter the monthly sales dwindled to 1.5 per cent of the year's total in June, 1919.

Raising Chickens Has Many Attractions for Those Who Enjoy Assocation With Fowls.

Poultry raising. like raising live steck in general, bas many attractions BUYING SMALL FARM TOOLS for those who enjoy the work. Men and women often enjoy association with animals and fowls. There are women making nice incomes from

Ground Bone Must Be Supplied to Laying Hens.

An egg shell is composed almost enthe body tissues to a more limited extent, Oyster shells, limestone grit or STALLION FARM VERY UNIQUE ground hone are essential in the ra-

## KILL GOPHERS IN ORCHARDS

Rodents Delve Deep at This Time of Year and Sometimes Nest Under Cherry Trues.

Look out for gophers and get them now. In well-drained orchards they kind in this country. It is to be known as the United States-Wyoming horse-crown of your best cherry-tree with giving much evid

# USED DICE TO TEST THEORY | came out 128, 74, 12 and 2.—St. Paul | well-dressed couple being ejected by

University Students Employed the selves to the fortunes of dice to prove "Bones" to Demonstrate the Law of Recurring Numbers.

a position on the University of Minne.

or disprove certain rules of recurring numbers.

Some cracking good exponent of the that with three dice it is a certainty Some cracking good cape trainer of that a given number will fall to turn pause that made her a witness of an aren's allowed to shmoke in here, and the galloping dominoes, may yet get up 125 times, and will turn up 75 times on one dice, 15 times on two position on the University of and once on all three of the dice, out and a crowd had gathered at the the sassiety women hang out and do students in the class studying state of 216 throws. The students found "Family Entrance." Over the heads it. But this is a respectable calcon."—

No Smoking There. A traffic lam at the corper of Sixth evenue and a street in the upper For- it's me that'll tache yez not to shmoke The theory they set out to test was sies forced the woman to stop. Later in the par-rior of me saloon. I've got she thanked her lucky star for the a sign up as big as yez piease Ladies

Students in the class studying that the rule worked, for the dice of the spectators she saw a fairly New York Evening Sun.

large and Irish and spoke with a de-

"Sure," he indignantly yelled, "and

lictous brogue.

it manes what it says. Sure and if There was a saloen on the corner, yez want to shmoke ye can go where