equivalent to that from a tank elevated about thirty feet. The engine will pump it up to about sixty pounds pressure, when it will stop, which would be equivalent to the pressure exerted from a tank nearly one hundred and twenty feet high.

With an elevated tank, either outside or in the attic, there is always danger of freezing, as well as leakage, if in the attic—a matter worthy of serious consideration; if outside, you have the elements of the weather to contend with, frost in winter, and heat in summer. In the winter you have ice-cold water, when you prefer it warmer, especially for your stock; and in the summer the water is too warm. The tank in the basement gives tempered water in the winter, and cool water in the summer. The weight, also, at a height to make it serviceable for fire-protection, is no small matter to take into account. In case of fire, with the tank in the attic, you are soon cut off from the water supply.

From a sanitary point of view, the pneumatic, air-tight tank is to be preferred, as no impurities can possibly enter. In case the tank becomes water-logged, from the loss of air passing out through the water, by opening a small valve at the pump you can pump in air to replace any loss.

I think there is not a question of doubt that the basement tank is the one to be preferred, and the windmill or any other power can be used to do the pumping, with the tank or tanks sufficiently large to tide one over a calm. The tank can also be located anywhere outside under the ground, below the frost point, if there is no room in the basement, but I would prefer it inside, where one can conveniently get at it at any time. These pneumatic tanks must be well made, especially for the work intended. The least leakage of air will soon destroy the power-giving force, hence the necessity of having nothing but a No. 1 tank specially made for the purpose. I do not think that these tanks will cost any more than a sheet-lead-lined tank (which are really the only ones that could be relied upon) of equal capacity, while the steel tanks would outlast the others, with far less probability of giving any trouble.

Having now a source of water supply at your command, it can readily be piped to all desired points. See that you have it convenient in kitchen, baths, the toilets, etc. I have frequently heard country people say that if they had sewerage connection they would instal modern conveniences, as they do not care to venture using the cesspool system. With the introduction of the septic-tank system for disposing of the sewage, farmers have equally as good a means of disposing the sewage as the best that any city can boast of. It is scientific, simple, and inexpensive, and can be constructed by any farmer of ordinary mechanical ingenuity. Space would hardly permit me here to give detailed instructions of how to build such a tank. Any plumber can give one all the information required. Suffice it to say that the principle upon which it is based is, briefly, as follows: The sewage passes into a water-tight receptacle—can be made of brick or concrete, and plastered well with cement inside. It is placed adjoining the house, provision being made for circulation of air through the upper portion of the tank, utilizing the soil pipes and stack, while the other vent pipe also finds an outlet above the roof. This circulation of air is necessary in order to propagate the millions of bateria or microbes which thrive therein and reduce all the solids. The liquid sewage finds an outlet through tile which can be carried away or connected to the system of field tiling. The cover of the tank is made tight, so that no gas or odor escapes. Ground can be used and sodded over so that it is unnoticed.

I have tried to briefly outline the system we have in operation; others may have something better. I trust many readers of "The Farmer's Advocate" who have not yet installed any system will investigate and devise some means, thus adding much to the comforts of home. Cheap plumbing devices are often dear in the end. Aim to get the best, which is none too good for the farmer, his wife and family.

Lincoln Co., Ont. W. B. RITTENHOUSE.

Manure Spreader—Split-log Drag.

Editor "The Farmer's Advocate":

I am strongly in favor of the manure spreader, which I believe saves both time and hard work, and makes better use of the manure. I spread my manure on root and corn land at the rate of about 15 loads or tons to the acre, and on wheat land about 9 tons, and we get good catches of clover where the manure goes beside the best wheat. I don't think there are many farms where 9 or 10 tons of manure to the acre will spoil the grain by lodging it, as one gentleman wrote of a few weeks ago.

Keep drumming up the split-log drag. It is the greatest road machine we have for its size, cost and simplicity, and every two miles of road could have one at the cost of only one day's work, and it will last for five or six years where there are not too many stones. Eight times over the road in a season will keep it in fine condition. That with three horses, at 40c. an hour, doing a mile an hour, is only $3.20 a season for each mile.

Brant Co., Ont. F. L.

Wheel for Dog Power.

A subscriber from Bruce Co., Ont., wishes directions for building a dog-power wheel for pumping water from a shallow well. For his benefit, as well as for the benefit of others who may wish to use dog-power, we reproduce from our issue of May 23rd, 1907, the ideas of S. J. Pym, of Huron County, with illustrations that will be found helpful.

Mr. Pym outlines the construction and the attachment to the pump as follows:

The wheel consists of, first, the hub (a), which is of hard wood, oak preferred, twelve inches in diameter, two inches thick. To this hub is fastened the spokes (d); the first pair cross at right angles, thus making four spokes; the others are fitted into the angles; fasten securely with screw nails to the hub. The spokes are 1 x 4-

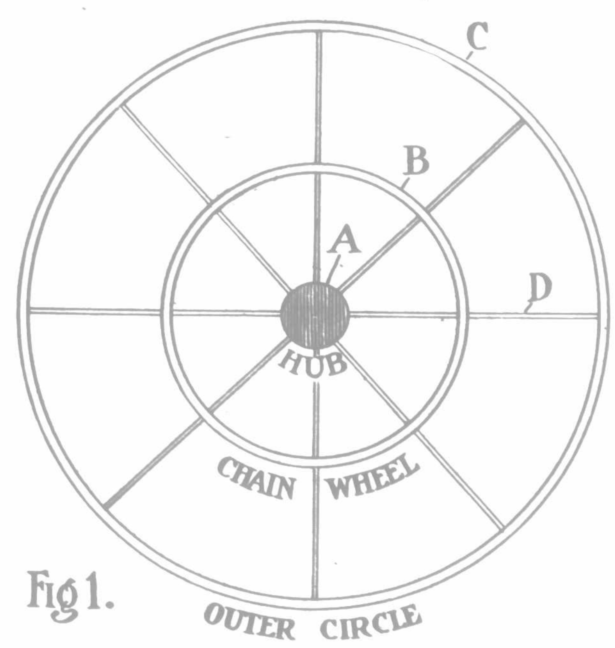

Fig 1.

inch pine or basswood. The outer circle (c), also 1 x 4 inch, is fastened to the spokes. Having done this, you have one of the two wheels required. Bore the holes in the hub of each wheel and put a shaft through them, and set up in the position you wish to have it run. Place those wheels 20 inches apart on the shaft. Now, with narrow boards 20 inches long, cover them all the way around. The [illegible] on this sheeting and between the spokes on either side, working in the wheel now complete. The wheel can be made 8, 9 or 10 feet high, according to the height of the ceiling where it is set up.

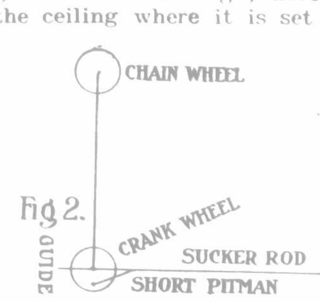

Fig 2.

The chain wheel (b) consists of two circles, 1 x 3 inches, nailed together, with a groove in the center for the chain. This circle is four or five feet in diameter, and is bolted to the spokes. The wheel is supported by an upright on either side, 2 x 8 or 3 x 8, through which the shaft runs. Some have the shaft tight in the uprights, and the wheel turning on the shaft. I have the shaft tight in the wheel, and slip box-bearings in the uprights to run on, which makes it run easier. One advantage of having the shaft stationary is that a stick can be fastened to it to tie the dog to while learning.

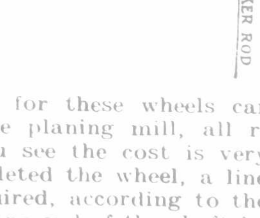

Fig 3.

The material for these wheels can be bought for $5.00 at the planing mill, all ready to put together, so you see the cost is very small.

Having completed the wheel, a line shaft, long or short, is required, according to the distance to the pump. On one end of the shaft is a pulley, 12 inches in diameter, to connect with the wheel by a chain; at the other end is a crank to connect with the sucker rod in the pump. This connection is made by having a short pitman, say 12 inches long, one end fastened to the crank, the other to the sucker rod. This takes the swing, and allows the sucker rod to move straight up and down. The rod should extend above the crank, if possible, and a guide placed on it to steady it. A six-inch stroke is quite sufficient.

If the pump is not too hard, this will generally work satisfactorily. I had to resort to another plan on account of having too large a bucket in the pump and the water low in the well. For an ordinary wood pump, a 3½ or 4 inch bore is large enough. I have the line shaft fastened to the joist overhead. Instead of connecting the crank immediately to the sucker rod, I have what we call a jig-stick, as shown in Fig. 3. This stick is fastened to the crank wheel by means of a short pitman, 12 inches long. The other end is fastened to the sucker rod. A fulcrum is fastened to the joist overhead; to this is attached the jig-stick, not in the center, but 12 inches from the sucker rod and 18 inches from the crank wheel, thus giving more power to lift the water. The stick extends past the crank-wheel connection about 8 inches, and to this end is a weight, to steady the jerk of the sucker, and it also helps to lift the water.

This plan works quite satisfactorily with me. The power is inexpensive, compared with a windmill or gasoline engine, for doing [illegible] work. I have an extra chain wheel on mine, also two chains. The pulper is run from one side, and the pump the other, and in all (the shafts, pulleys, etc., included), the cost was less than $10.

To Catch Sparrows with Net.

Editor "The Farmer's Advocate":

I am an old Englishman, and if I live till April shall be 80 years old. Have one son and two daughters living on Manitoulin Island. I read "The Farmer's Advocate," and was quite interested in the piece about the English sparrow, in the November 19th issue. Now, although I am a real Englishman, born in London (Eng.), I do really think there are too many sparrows in many places on this Island; and, when I was at my daughter's, in Barrie, a year ago last summer, I was amused to see the little fellows fight on the streets, and so persistent were they that horses would nearly step on them. You say they drive bluebirds and others birds from the garden and orchard; I have seen the like done at our place, and have no doubt but that it is done at many others. I do believe that a pair of sparrows would drive a pair of robins from a chosen tree in the orchard, near the house, if the sparrows wanted the place the robins had chosen. And, although the sparrow does eat many worms and grubs, I think he likes nice clean grain in the barn quite as well, and it is easier to get. So, I think the natural birds are the best to have around our homes.

It is suggested that the school children be encouraged to collect all the sparrows' eggs and nests possible to keep them in check. Now, I think I know a much safer and quicker way. When I was a boy, and wild pigeons were plentiful, my brother used to catch them with a net. I do not remember how many he could catch at a haul. I think we could catch sparrows the same way in winter on the barn floor, and the children would not need to climb to the danger of breaking their limbs or necks.

It would require a net of smaller mesh than one uses to catch herring. If I can get a suitable net, I should like to try to catch the sparrows in the barn, and if I get along well, I might have many of them before the snow is gone. EBENEZER TRACY.

Manitoulin Island, Ont.

A Sparrow Trap.

Editor "The Farmer's Advocate":

I fully approve of "The Farmer's Advocate's" position re the sparrow nuisance. When a farmer sees from one-half to a full acre of wheat destroyed every year by this feathered nuisance, he is very apt to disregard foolish appeals to sentiment. Even from a sentimental standpoint, the sparrow is an outlaw. Many a time I have watched them trying to dispossess the barn-swallow of her mud-built walls. At times I have found the barn-swallow's eggs cold and rotting beneath the super-imposed floor built by the sparrow. The wren is another sufferer in the same way; in fact, wrens have become very scarce in this district, almost disappearing as the sparrow has become more numerous.

As to ways and means of doing away with the sparrow: Destroying nests and eggs is very good, but the birds will seek another place, build another nest, and lay another clutch of eggs. Destroying the birds themselves is the most effective means. Winter time is the best time for the job. Catching with a lantern at night in the straw-stack and barn is very effective. Throwing grain on the ground, so as to gather the birds in a bunch, and then shooting into the flock, often wipes out a handful of the robbers. In fact, never lose a chance to kill a sparrow, and you will do your share to hold them in check. Organized sp[illegible] the losing side to pay for the supper [illegible] good plan, as it