

pens, fresh, dry bedding; keep the lot free from mud-holes, and the pigs will be healthier, thriftier and cleaner. In sections where disease is prevalent, running water, unless from a spring within one's control, is not desirable for hogs. It too often carries the germs of disease from some unknown farm farther up stream.

The Experiment Station at Grand Rapids, Minnesota, is raising bacon hogs—Improved Yorkshire—and practices having sows farrow in March and April. Eight pigs per sow have been averaged the last three years. The pigs are turned into a clover pasture when from six to eight weeks old, and are fed a little shorts and milk. In September, barley and peas are added to their ration, and for two months they are fed all they will eat. They reach prime condition about the first of November, and weigh from 130 to 150 pounds. In the local market, the price the past three years has averaged eight and a half cents a pound. The cost of production has been estimated by Supt. McGuire to be four and one-half cents a pound. Good housing, early farrowing, clover pasture, skim milk, barley, shorts and peas, easily obtained with little expense, make a good profit in the pig industry.

THE FARM.

Per Cent. of Grade.

A one-per-cent. grade on a road means a rise of one foot for each hundred feet of distance travelled up the hill. A ten-per-cent. grade means ten feet rise in each hundred feet so travelled. A one-per-cent. grade, then, means that, in travelling up hill one mile, an ascent is made of 52.8 feet, while a ten-per-cent. grade means a rise in altitude of 528 feet in a mile. Accurate tests have shown the Minnesota Experiment Station that a horse which can pull 1,000 pounds on a level road, can pull only 810 pounds on a rise of one foot in fifty, and on a rise of one foot in ten he can pull only 250 pounds. These facts show that the greatest load that can be hauled over a road is the load which can be taken up the steepest hill on that road, or through the deepest mud-hole. It is, therefore, advised that all highways travelled by heavily-loaded vehicles should be kept within a three or four-per-cent. grade, if practicable. To do this may require a change of location to get around hills, always keeping in mind that the lower the grade, the larger the load may be hauled, and the cost of haulage kept at the lowest point.

A Hay Derrick.

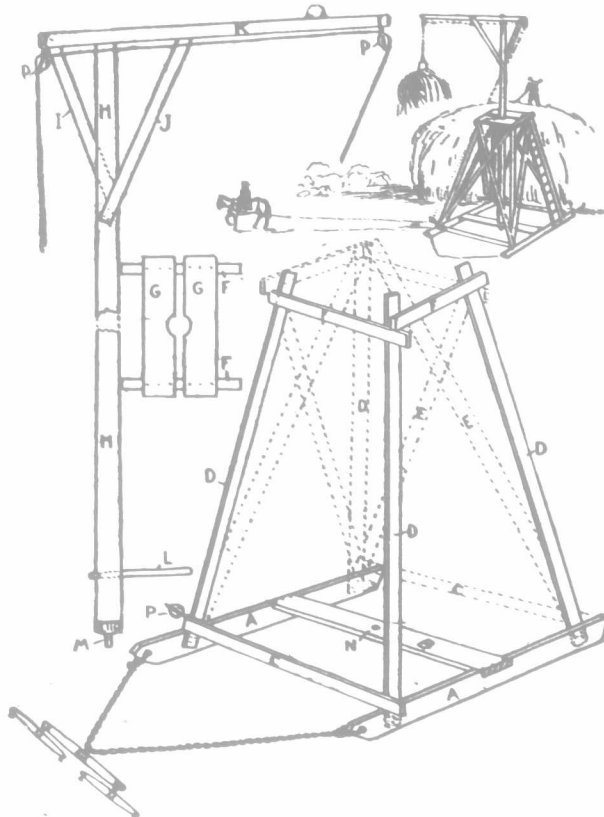
The hay derrick shown in the illustration was described in the Ohio Farmer in 1905, by A. B. Crandall, and is reproduced in a recent issue of that journal, in reply to an inquiry for such a device. It is said to have given good satisfaction where used. To build this derrick, the following pieces of timber, etc., will be needed:

Sketch letter.	No. of pieces.	Dimensions.
A.....	2	2 x 8 in. x 12 ft.
B.....	1	3 x 6 in. x 10 ft.
C.....	2	3 x 4 in. x 10 ft.
D.....	4	4 x 4 in. x 12 ft.
E.....	8	1 x 5 in. x 14 ft.
F.....	4	3 x 4 in. x 5 ft.
G.....	2	2 x 8 in. x 6 ft.
H.....	1 telephone pole	25 ft.
I.....	1	2 x 4 in. x 8 ft.
J.....	1	2 x 4 in. x 14 ft.
K.....	2	2 x 4 in. x 16 ft.
L.....	1 crowbar	5 ft.
P.....	3 pulleys	
M.....	1 iron pin	1 1/2 ft.
N.....	1 hole for iron pin.	
24 bolts 6 to 8 inches long.		

The frame is mortised together, all the cutting being done on the corner posts, D. The two pieces, C, are not mortised, but are bolted flat. It is necessary that the piece B shall be a very strong one, as the entire weight of the pole and arm, H and K, rest solely on this. It is well to block up under this at N when in use. The pole has a pin, M, which rests in hole N, and the two pieces, G, G, on the top of F hold the pole in place. An iron hoop should be placed around the base of the pole at M to prevent splitting. The arm K is made of two 2 x 4 pieces, which clamp on each side of the top of the pole, H, being bolted together.

In making the derrick, the frame should be made, leaving one side open, without braces E, E, and crosspiece F. One piece of G should be left off, also, but have holes, bolts, etc., all ready. The pole, with its arm, braces and pulleys, is prepared complete, and then, by means of block and tackle, attached to the F opposite to that which is not yet on, the pole, with its base-pin in hole N, is raised up into place against G. Then the other piece, G, is bolted in place, which holds the pole. Then close up the side with the braces E, E, and put on F. A crowbar, L, is in-

serted into the pole near the base, and is used to swing the poles and arm in any direction. One team can pull this machine easily to any place, and it need never be taken apart when once completed. When taking the rope out at the end of the season, it is well to pull a strong string through the pulleys with which to pull the rope back in again another season, or someone may have to do some "tall" climbing. An entire hay cock can be easily lifted straight from the ground with this derrick to a level with the top



Hay Derrick.

of the stack, then carried over and dropped at any place on the stack. It will keep two men busy on the stack all the time, and they will not have to reach over the edge of the stack to help get the hay up. It does not drag the hay up the side of the stack, as many pitchers do, and it does not make the stack heavier on one side than on the other. It can be used on a round stack or a long rick.

Saving and Application of Manure.

The following copy of a circular letter prepared by J. S. Kemp, a practical farmer who has experimented with the application of farmyard manure, and has had many inquiries asking for his experience, contains some valuable recommendations, which we are pleased to pass on for the consideration of our readers:

Some thirty-four years ago found me on a worn-out farm, in the Province of Quebec, Can-



Making Hay on the Farm of James Armstrong, Emo, Rainy River, Ontario.

ada. The problem was how to reclaim this worn-out soil. I decided to engage in the dairy business, keeping of hogs, and feeding for beef. I was very careful in the saving of the manures, both liquid and solid, and in their application, realizing that the plant must take its food in the liquid form. I was careful to spread the manure as fine as practically possible by hand, but I could not get my help to do the work satisfactorily, neither could I do it myself as I knew it ought to be done; and one day, while engaged in spreading manure, the thought occurred to me that there ought to be a manure-spreading machine. So I built the spreader that is saving a great amount

of the heaviest labor of the farm, and getting twice the value that was obtained under hand-spreading. This also led to more carefulness in saving, and the spreader is saving many million dollars every year to the American farmer.

As to the saving and application, my method has been to put a part of the horse manure into the hogpens, the balance into the trench behind the cows to absorb and save liquids, and, for all distant fields, to draw it out in large piles direct from the stables, ready to be spread with the spreader when wanted, in this way saving the time that it would take to draw it from the yards and barns in the hurry of seed time, also avoiding the waste that takes place when left in the barnyards, in the snow and ice, and under the eaves of the stables, exposed to the melting snow and rains, dissolving out and carrying away a large per cent. of its fertilizing properties, and being rinsed over the same ground each year where it is not needed; but when drawn direct from the stables, there will be practically no washing away, the pile absorbing nearly all the melting snow and rain that falls on it.

When spreading on plowed ground, I first harrow, and then roll. Under this method, a pair of fairly good horses will handle the spreader that is equipped with a flat-toothed cylinder. I then harrow and roll, and the ground is ready for seeding. The fine manure being mixed with the surface of the soil, is available to the plant when it will do the most good, which is when it first puts forth its roots in search of its food. The sooner it has a vigorous, healthy growth of root and foliage, the better. All plants feed more or less from the air. The vigorous, healthy plant gets its full share, while the poorly-fed, stunted plants get very little. It is while the plants are young that they obtain the most food in this way, getting less and less as they advance towards maturity, hence the importance of the plant food being so placed that it can get it when most needed. I never plow down manure, as I am able to get better results by having it mixed with the surface soil. Often, in early spring, we get more rain than is needed, and usually cold rains, rinsing out the liquids that have been absorbed, also dissolving and carrying down and away the more solvent parts of the solid manure, while the plant's roots are keeping near the surface to avoid the wet and cold, while what was intended for their food is being washed away.

My farming has always been for the dairy, and when I find a meadow failing I top-dress it. The number of loads to the acre depends upon how much is available, and its quality, etc. For example, if I had two acres that need manure, and have only sixteen loads, I would divide it, and manure both acres, and, where grain has been fed quite liberally, I have, with good results, put on with a size B. B. spreader as low as four loads to the acre. Time, anywhere from first of August to the middle of October. I like to have the manure on the spot, and, if possible, to spread it when the ground is comparatively dry, and just before a rain. Avoid spreading when the ground is very wet, not only because the wheels will cut the meadows, but, if spread when the soil is wet, and the rain continues, it cannot absorb the fertilizing properties as they are dissolved, and a large per cent. is washed away.

When manuring meadows that are to be plowed, I manure as early as possible after the hay is off, and plow in the fall. In this way we get a rich sod of roots and foliage to plow down. This is the best possible method for potatoes. Manure is a natural fertilizer, and will show results even when not applied at the proper time and manner. But the best farmers are those who want the best results, and are working and studying to obtain them. The fact is that the people of this continent, coming into so vast a possession of new, fertile lands, have depleted large areas before they

realized the necessity of careful saving and application of manures, and at first they paid no attention to the saving of the liquid manure by the use of absorbents. It was made and thrown into the barnyards and under the eaves of the stables, exposed to the melting snow and rains, which carried away a large per cent. of its value, and it was knowledge of this condition that led some agricultural colleges to recommend spreading manure in winter. Believing this to be good authority, some adopted the plan; for, as I once said in a talk before a Farmers' Club, "It is easier to make a man believe a thing he wants to believe is right, even when it is an error, than to make