CONSTRUCTION AND USE OF THE KING SPLIT-LOG ROAD DRAG

There are over 2,000,000 miles of earth roads in the country, and the split-log drag is of great service in keeping them in economical repair. The drag is used in many states and in foreign countries. It is used with two, three or four horses, and is easily constructed.

The two-slab log and plank drags have proven the most satisfactory. Double drags for working both sides of the roadway simultaneously have been tried with only limited success. The reason for this is that both sides of an earth road are never exacty alike. This causes the two parts of the drag to work unevenly and to interfere with each other.

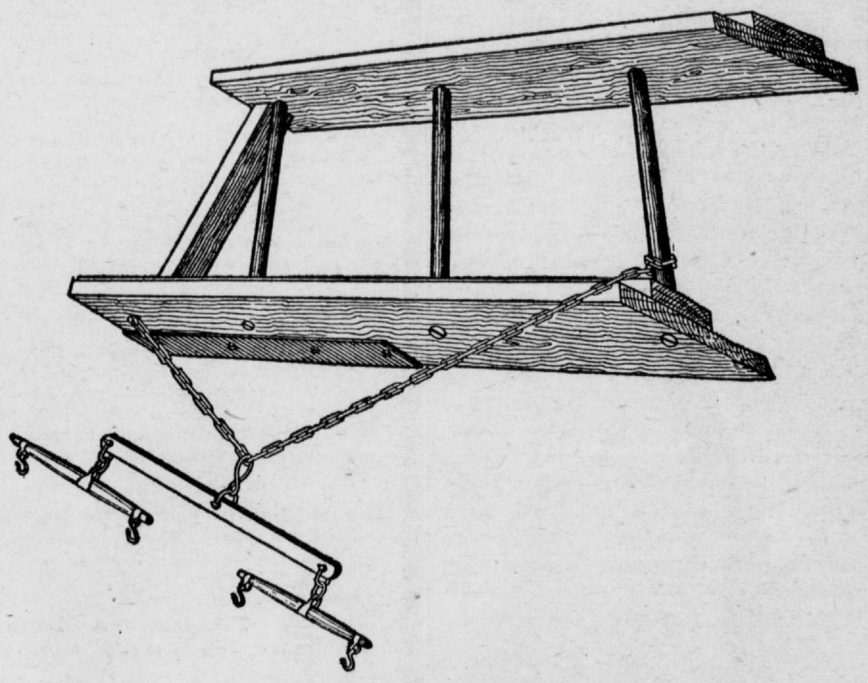
HOW TO BUILD A LOG DRAG.

It is a mistake to construct a heavy drag. A dry red cedar log is the best material for a drag. Red elm and walnut when thoroughly dried are excellent, and box elder, soft maple, or even willow are preferable to oak, hickory, or ash.

The log should be seven or eight feet long and from 10 to 12 inches in diameter and carefully split down the middle. The heaviest and best slabs should be selected for the front. At a point on the front slab four inches from the end that is to be at the middle of the road locate the center of the hole to receive a cross stake, and 22 inches from the other end of the front slab locate the center for another cross stake. The hole for the middle stake will lie on a line connecting and half way between the other two.

The back slab should then be placed in a position behind the other. From the end at the middle of the road measure 20 inches for the center of the cross stake, and six inches from the other end locate the center of the outside stake. Find the center of the middle hole as before. When these holes are brought opposite each other, one end of the back slab will lie 16 inches nearer the center of the roadway than the front one. The holes should be two inches in diameter. Care must be taken to hold the auger plumb in boring these holes in order that the stakes shall fit properly.

The two slabs should be held 30 inches apart by the stakes. The stakes should taper gradually toward the ends. There should be no shoulder at the point where the stakes enter the slab. The stakes should be fastened in place by wedges only.



KING ROAD DRAG MADE OF PLANK

When the stakes have been placed in position and tightly wedged, a brace two inches thick and four inchs wide should be placed diagonally to them at the ditch end. The brace should be dropped on the front slab, so that its lower edge shall lie within an inch of the ground, while the other end should rest in the angle beween the slab and the end stake.

A strip of iron about three and one-half feet long, three or four inches wide, and one-fourth of an inch thick may be used for the blade. This should be attached to the front slab, so that it will be one-half inch below the lower edge of the slab at the ditch end, while the end of the iron toward the middle of the road should be flush with the edge of the slab. The bolts holding the blade in place should have flat heads and the holes to receive them should be countersunk.

An ordinary trace chain is strong enough to draw the implement, provided the clevis is not fastened through a link. The chain should be wrapped around the rear stake, then passed over the front slab. Raising the chain at this end of the slab allows the earth to drift past the face of the drag. The other end of the chain should be passed through the hole in the end of the slab. One and one-half trace chains are sufficient

THE PLANK DRAG.

Drags are often constructed of planks instead of logs. The plank should be strengthened along the middle line by a two by six inch strip. A triangular strip may be used under the lower edge of the blade to give it the proper cutting slope.

OPERATION OF THE DRAG.

The successful operation of the drag involves two principles, which when thorouhgly understood and intelligently applied make road working with this implement very simple. The first concerns the length and position of the hitch, while the second deals with the position of the driver on the drag. For ordinary purposes the snatch link or clevis should be fastened far enough toward the blade end of the chain to force the unloaded drag to follow the team at an angle of 45 degrees. This will cause the earth to move along the face of the drag smoothly and will give comparatively light draft to the team, provided the driver rides in the line of draft.

It small weeds are to be cut or a furrow of earth is to be moved, the doubletree should be attached rather close to the ditch end of the drag. The drag will now move nearly ditch end foremost, and the driver should stand with one foot on the extreme forward end of the front slab. This will swing the drag back to the proper angle and will cause the blade to plow. This hitch requires slow and careful driving in order to prevent the drag from tipping forward. If the blade should plow too deeply, the driver should shift his weight toward the back slab. If straw and weeds clog the blade, they can usually be removed if the driver shifts his weight to a point as far as possible from the ditch or blade end.

Usually two horses are enough to pull a drag over an ordinary earth road. When four horses are used they should be hitched to the drag by means of a four-horse evener. The team should be driven with one horse on either side of the right-hand wheel track or rut the full length of the portion to be dragged, and the return made over the other half of the roadway. The object of this treatment is to move earth toward the center of the roadway and to raise it gradually above the surrounding level. While this is being accomplished all mudholes and rut will be filled, into which traffic will pack the fresh earth.

ELEMENTS NEEDED BY THE DAIRY COW FOR PROFIT TO FARMER

(Continued from last issue)

From the investigations of the amounts of protein and carbohydrates required by cows made at various stations, we learn that on the average a cow can economically use from five to seven and one-half pounds of digestible carbohydrates to each pound of protein. This proportion or ration of protein to non-protein substances is what is known as the nutritive ration. It is designated "N. R." To make this term more comprehensive let us figure the nutritive ratio (N. R.) of one of our common feeds—wheat bran.

NUTRITIVE RATIO EXPLAINED.

The table of digestible nutrients tell us that 100 pounds of bran contain 12 pounds of digestible protein; 42 pounds of digestible carbohydrates and 2.5 pounds of digestible fat. The first step is to reduce the fat to terms of carbohydrates. This we do by multiplying the 2.5 pounds of fat by two and one-fourth, because each pound of fat contains as much energy as two and one-fourth pounds of carbohydrates. This gives us 5.625 pounds which now may be considered carbohydrates. This added to the 42 pounds of digestible carbohydrates given in the table makes a total of 47.625 We have 12 pounds of digestible protein to 47.625 pounds of digestible carbohydrates, or by reduction, dividing the 47.625 by 12, we find we have 3.96 pounds of carbohydrates to every pound of protein. Therefore the N. R. of wheat bran is 1:3.96, approximately 1:4.

HOW THE NUTRIENTS MAY BE SUPPLIED.

When we stop to consider how many different feeds are available for feeding to the dairy cow, and how apparently different is the composition of each feed, we cannot help but wonder how the dairymen could produce milk at a profit when the old methods of feeding are practised. Perhaps this is a partial explanation of why so many dairymen are not making their dairies pay today.

The fact that a cow eats freely of the feed she has been given is not sufficient proof that it is what she needs. Perhaps she is craving one element, only a small amount of which will be found in the feed that is put before her. In such a case it becomes necessary for the cow to eat more than is required of other nutrients in order to get enough of the one in which this particular feed is deficient. A very striking example of this practice is shown when alfalfa hay is fed as the exclusive roughage with bran and shorts as the concentrated feeds. Both of these feeds are rather narrow, (N. R. about 1:4), and do not furnish sufficient starches and fats when taken in normal quantities to meet the requirements of the animal. The cow must have more carbohydrates, and she is therefore forced to eat considerably more protein than she needs in order to get enough of the carbohydrates, from which she derives her energy. The fact that protein is capable of being transformed into carbohydrates and fats is made use of in such an intance as this; but the expulsion of a large amount of nitrogen, one of the principle constituents of protein is necessary under such conditions, and this greatly taxes the cow's kidneys and thereby impairs her milk secreting function.

So we must look into the comparative composition and digestibility of the feeds before we can select them judiciously, and the whole ration must approach the ideal in every respect.

AN IDEAL RATION.

The first and most important requisite for an ideal ration is that it shall contain all the nutrients necessary to maintain the body of the cow, and to produce the milk the cow is capable of producing, and that these nutrients be in the proper proportions. The second requisite is that the ration should be composed largely of roughage. It should be sufficiently bulky to fully distend the digestive organs of the cow. Practical experience has shown that a proper balance is reached when about two-thirds of the total dry matter of the ration is in the form of roughage and one-third in the form of concentrates.

In addition to this, an ideal ration should be palatable, so that an animal will eat it with a relish. While little is known concerning the effect of palatability, it is certainly true that of two feeds alike in all other respects, the one most readily eaten by the animal will give the best results.

The last requisite of an ideal ration