

assurance of someone who did not give a fair trial to the plan of immediate feeding. A common mistake is to use a fork and carelessly dig into the mass, loosening much more than is required, and leaving a roughened, uneven surface. Under these circumstances, results will not be satisfactory; but where care is exercised, the results of commencing to feed from the silo as soon as filled cannot be other than satisfactory, providing the feed is required then, and that there is sufficient to last until grass comes the next spring. We know this by our own experience.

## THE FARM.

### Peep Sights for a Drainage Level.

Editor "The Farmer's Advocate":

Some considerable time ago I contributed to "The Farmer's Advocate" a series of articles on "Farm Drainage Operations," in which I described a homemade drainage level suitable for farmers' use in determining the rise or fall of the ground along the proposed course of a ditch, and for finding the grade of the ditch, and also for digging to that grade.

We now have a valuable improvement to that instrument in the form of peep-sights, that make it much more speedy and accurate. To best explain them, and their use, it will be necessary to revert to the use of the instrument itself.

Figure I. will recall the design of the homemade drainage level, and figure II. will show its use. If the fall between two points, say stake 0 and stake 100, is to be determined, the upright is sunk firmly into the ground as nearly perpendicular as possible about half-way between the two stakes, and in line with them, and the cross-piece made horizontal by means of the spirit level and thumbscrews. Two men are required to do the "levelling," A to sight, and B to hold the staff (or measuring pole), and place a target (pencil, or something similar) across the staff, where directed. The staff is first placed on the ground at stake 0, and A sights backward along the top of level, and directs B to place the target across the staff, and raise or lower it until it is in line with the level; and when correct, B makes a note of the number of feet and inches the target is from the ground. When this is done, B moves forward to stake 100, and stands the staff on the ground there, and A, without moving the level, turns round and sights forward to the staff, directing B as before. When the target is just level with the instrument, B again notes the reading. In figure II. the back reading was 4 feet 10 inches, and the foresight 4 feet 1 inch. In both cases the target was level with the instrument, consequently the difference in reading must be due to the rise in the ground, and, therefore, the amount of rise must be nine inches. The height of the instrument is immaterial; the difference between the two readings will be the same, no matter whether it is on high or on low ground. When the rise or fall from stake 0 to stake 100 has been determined, the level is next placed about half way between stakes 100 and 200, and the rise or fall between them determined in the same way. The level is next set between stakes 200 and 300, and the same operation repeated, and so on over the whole course of the ditch. When this is completed, all the rises or falls, as the case may be, may be added together, giving the total rise or fall. If there are both rises and falls along the same ditch, as frequently occurs where a knoll or a hollow has to be crossed, the difference between the sum of the rises and the sum of the falls will give the net rise or fall. And when the net rise or fall is known, and also the length of the drain, it is an easy matter to find the rise or fall per rod or per 100 feet.

This is a simple instrument and a simple method, and yet we find that many have difficulty in using it, because: (1) They are not trained in sighting, and it is difficult to sight accurately along a straightedge; (2) on a warm day, the sun beating down on the spirit level heats it, and it in turn heats the air, which is thus made less dense, "thinner," we would say, using a colloquial term, than the air beyond the ends of the level, so that the rays of light coming from the target to the eye are bent—refracted, to use the technical term—in passing from the dense air at the end to the "thin" air over the level, and consequently we see the target higher up than it really is, and thus get a false reading. We are all familiar with refraction; even the youngest schoolboy has put a stick in a pail of water, or maybe a pond, and wondered why the stick was "bent." The rays of light coming from the submerged part of the stick are refracted or bent in passing from the dense water to the less dense air, making the stick appear too high in the water. Similarly, the light from the target, in passing from the dense to the less dense air, is refracted, giving a false reading. The trouble may be overcome in a measure by sighting along the corner of the level, instead of over the top, but even then it is very difficult to eliminate the error entirely, and very hard on the eyes, both of which facts those who have tried to sight over a

spirit level on a hot day know full well. Since the homemade drainage level was first described, we have been striving to devise a simple set of sights that would overcome the difficulty, and we have now succeeded. Figure III. shows a pair of them. The chief point to note is that each has a peep-hole and a cross-wire. When in use, they are clamped on a spirit-level, so that the peep-hole of one is opposite the cross-wire of the other. With these the line of sight is raised sufficiently above the level to avoid the error of refraction, and the most inexperienced can sight accurately with them, as, looking through the peep-hole, it is very easy to tell when the target is in line with the wire.

At this point it might be well to remark that a dark lead pencil, or anything dark, makes a poor target for use either with or without the sights. Something pure white is much better, and for a simple reason: Both the level and the wire are dark in color, and the white target gives more contrast, and is, therefore, more easily seen, more

distances, we know that they cannot be relied on for more than 50 feet each way, and consequently we advise against using the homemade level over greater distances than 50 feet.

The body of the sight is made out of one piece of sheet brass, bent into the shape shown in Figure III. It is punched and drilled as required, the wire soldered in, and a nut soldered on one end for the set-screw. At first we hoped they were so simple that farmers might have their tin-smiths make them up. Every set we made was correct on first trial, but, after testing with our surveyor's level several sets made by tin-smiths, we found that it was a pretty difficult thing for them, not understanding the value of absolute accuracy, to get the two peep-holes and the two cross-wires all exactly the same height, and that a small variation made a considerable error in the readings, and that, therefore, it was necessary to have every set tested, and corrected, if in error, before they could be relied on. Convinced, however, that the sights would be of great practical value to those wishing to do drainage work, I submitted the idea to a firm which has facilities for making the sights accurately and testing them, and they consented to make a small trial lot, and, if the demand is sufficient, to make more and keep them in stock for sale. Elsewhere they may be found advertised in this issue.

As these sights must often be carried about in the pocket when not in use, and as the cross-wires are very fine, and, therefore, somewhat frail, it was necessary to devise some simple means by which the latter might be protected. When not in use, the two sights should be clamped face to face by a small brass keeper. In this position the wires are absolutely protected, and the sights may be conveniently carried in the pocket.

I am hoping that these sights, in actual practice, will prove as helpful as they promise.

WM. H. DAY.

### A Five-year Rotation.

Editor "The Farmer's Advocate":

It is with interest I have read the discussion on after-harvest cultivation in your columns, describing methods which, undoubtedly, have given satisfaction in a great many cases, starting the stubble and grass to rot, and encouraging the germination of seeds. As a rule, we have practiced it very little. By following a short rotation we find it unnecessary.

Besides some alfalfa and permanent pasture, we have about 100 acres which we try as near as possible to keep in rotation, described in the following sketch, and up to date have found it easy to keep the weeds in check. It has been stated by good authority that short rotation will destroy sow thistle, which has got such a strong foothold practically all over Ontario and in parts of the West. We will not vouch for the truth of this, as we have never been troubled with this pest, but firmly believe that the lack of this is the reason, as there is abundance of it in South Grey.

By following this practice our crop is always on sod and root and rape land. As a rule, there is not much corn grown here, there being practically no silos as yet, but we expect there will be in the near future. There is considerable rape grown for fall feed. The field for roots and rape is plowed after harvest. Manure is applied in winter for roots, viz., potatoes, turnips, mangels and corn (if any), then a lighter coat for rape, which is best sown in drills and cultivated with the scuffle, which leaves the land clean and in an ideal condition for crop and clover, and practically always we get a good stand of clover.

1909—Roots and rape.  
1910—Grain, seeded with clover.  
1911—Clover hay.  
1912—Pasture.  
1913—Grain on sod, plowed in fall of 1912.

1909—Grain, seeded with clover.  
1910—Clover hay.  
1911—Pasture.  
1912—Grain on sod, plowed in fall of 1911.  
1913—Roots and rape.

1909—Grain on sod, plowed in fall of 1908.  
1910—Roots and rape.  
1911—Grain, seeded with clover.  
1912—Clover hay.  
1913—Pasture.

1909—Clover hay.  
1910—Pasture.  
1911—Grain on sod, plowed in fall of 1910.  
1912—Roots and rape.  
1913—Grain, seeded with clover.

1909—Pasture.  
1910—Grain, seeded with clover.  
1911—Roots and rape.  
1912—Grain.  
1913—Clover.

If this land is not cultivated and clean of weeds, it is better to plow for the

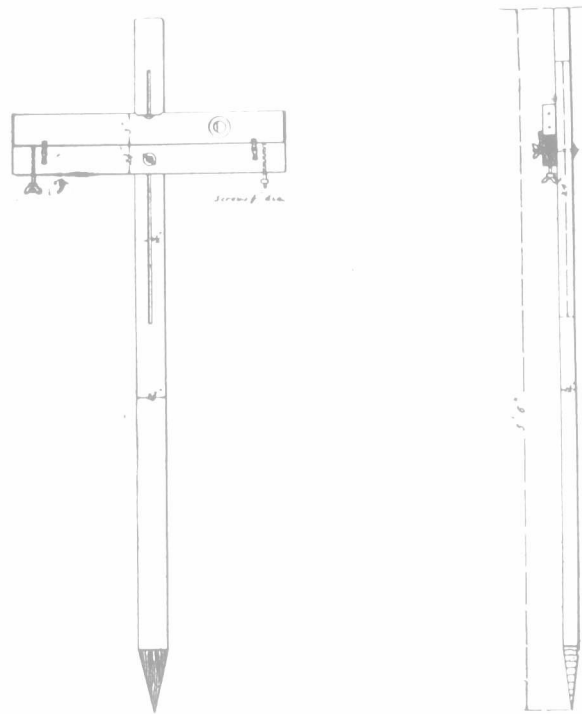


Fig. 1.—Homemade Drainage Level

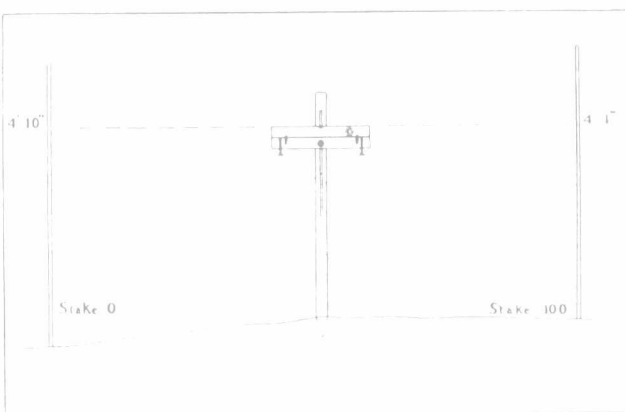


Fig. 2.

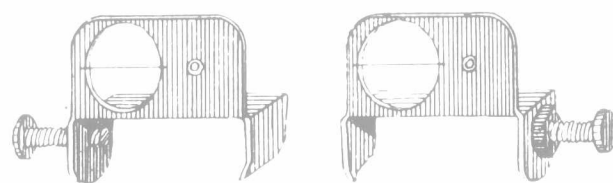


Fig. 3.—Peep Sights.

accurate, and easier on the eyes as well. A little strip of wood painted white, and which may be carried in the vest pocket, makes a splendid target. We make ours about six inches long, and one-half inch wide for half its length, and an inch wide for the remainder. The narrow end is used when sighting short distances, up to 50 feet, and the wide end for longer distances. We also cut a slot up the center of the target for use with the sights, and note the reading through this slot. This is more correct than reading the top or bottom of the target. Distances of 150 feet on either side of the level can be read accurately, and if a wider target were used, greater distances still might be read, but here comes in another difficulty. One cannot be certain when the spirit level is absolutely level, for it has no graduations on the glass by which one can tell when the bubble is exactly centered. By frequently testing spirit levels with a surveyor's instrument over various