fore, when an agent of another paper tells you that THE FARMER'S ADVOCATE can be dropped from your list because his paper carries an agricultural page do not forget *reliability* and *first-hand news*.

Why Boys Leave the Farm!

An American poet-philosopher says that the trouble with agriculture in the United States is that those engaged in it have to work too long and too hard. He proceeds to harangue his fellow countrymen about it, pointing out that rising in the small hours, working in the fields from sun up till dark, and then burning kerosene for several hours doing chores, tends to dissatisfy the younger generation with farm life.

While there is such a thing as poetic license and versemakers are allowed a good deal of liberty in laboring with their themes, they are supposed to keep as near the truth as they can without interfering with the jingle of their lays. This one evidently overlooked that point and made facts to suit his rhyme, instead of making his rhyme conform with facts, for according to United States agricultural authorties, the hours of labor on the farm are steadily decreasing, and farmers on the average work fewer hours per year than workers in most other lines. It would appear, therefore, that the boys who quit farming because they have to work too hard, and migrate to the cities in search of soft snaps are being badly fooled. Some of them certainly are. Agriculture, in the matter of hours of labor, bears favorable comparison in these days with any industry or profession. Not only that, but manual work is decreasing in agriculture more rapidly than in any other line.

Cost of Producing Farm Crops

Few farmers are in the habit of calculating the cost of producing crops, raising stock, feeding hogs or keeping poultry. It is comparatively easy to figure returns from a wheat crop, and at present prices a farmer can be fairly certain that wheat growing is profitable without going to the trouble of figuring up the cost of production. But one cannot be so certain of the profits accruing from other lines. And despite the fact that calculations may be readily made, few farmers can say definitely what the difference is in returns from crops of oats, barley or wheat. To find the soundness or unsoundness of his position the farmer has to make estimates of the costs of production for himself, using everyday practices as the basis of his calculation. Estimates made at experiment stations, or compiled from data gathered by the census takers are correct to a certain extent, but the man who wants to know his position exactly has to calculate from his own operations.

There is a wide difference sometimes in the cost of producing crops on farms lying side by side and similar in every outward feature. There is considerable difference at times in the cost of manufacturing the same commodity, in mills similarly equipped and equally advantageously situated. The questions of profit or loss depends very largely on the man, and it is for the man to know by calculations of his own the exact condition of his business. Nothing is more instructive, or will suggest better methods in management than the careful estimation of the cost of production.

Peep Sights for Drainage Levels

EDITOR FARMER'S ADVOCATE :

For general drainage 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 is very much needed. 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. shows the design of the homemade drainage level, and figure II. 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 the level, and directs B to place the

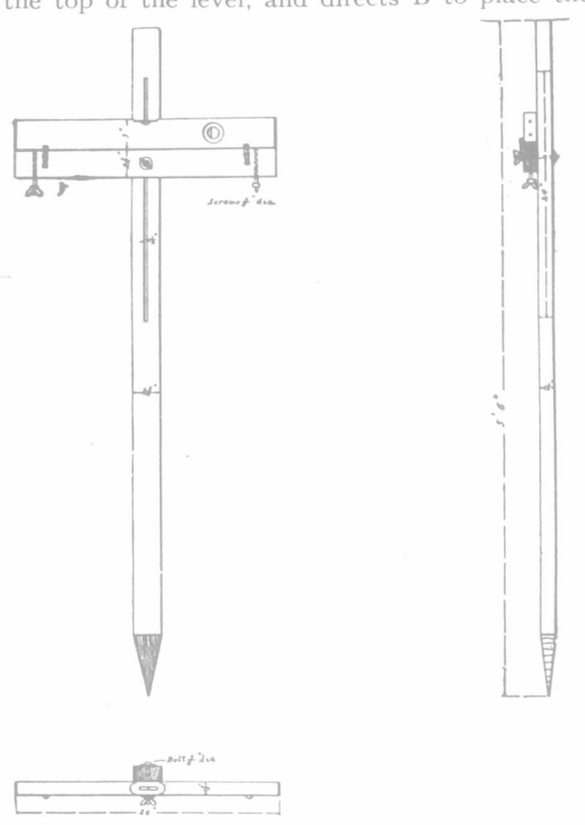

FIG. 1.—HOMEMADE DRAINAGE LEVEL.

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. B then 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 put in use 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.

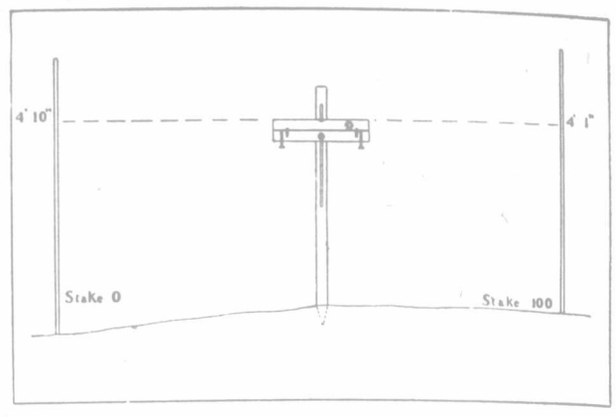

FIG. 2.

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 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

FIG. 3.—PEEP SIGHTS.

distances. We also cut a slot up the center of the target for use with the sights, and note the reading through the 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 distances, we know that they cannot be relied on for more