

## LAYING OUT THE FARM FOR LEVELING.

Now, if we are to take levels every 100 feet square we must have some method of finding those points without measuring them all, for it would mean an immense amount of labour to measure out and stake a whole farm. The method we follow may be understood by the aid of Fig 12. A B C D represents the area to be surveyed. After having walked over it in company with the owner and learned all we can about it, located the probable outlet, and formed an estimate of the probable difficulties to be encountered, we select a base line, say A D, and run two rows of stakes right down through the centre, parallel with the base line, and a full number of hundreds of feet from it, both the rows and the stakes in them being 100 feet apart. When this is done, we run a pair of cross-rows at right angles to the first two, rows and stakes being 100 feet apart as before. If the piece is so large that the cross-rows cannot be seen half way, two pairs may be needed, as shown in the figure, or even more. Lath are used for stakes where available. We make no attempt to stake out the area permanently, for in very few cases is the draining to be done immediately, and permanent stakes through the fields would be in the way in the meantime. But enough permanent stakes are set to enable the farmer to put up the rows again if necessary to locate the drains. These permanent stakes are always indicated on the map, as will be seen later.

## TAKING THE LEVELS.

When the staking is done as indicated, the level is set up near one corner, say at L<sub>1</sub>. As with the home-made level, two men are needed, a levelman and a staffman. When the instrument is "levelled up," the staffman sets the staff on the ground in the corner of the field, e.g., at A, sighting two ways, east and north in this case, and putting himself in line with stakes in two directions. When the level-reading has been taken, he moves north 100 feet from the corner, as shown by the X opposite the words "station 1," sighting himself in line both north and east as before. Another reading is taken by the levelman. The staffman then moves 100 feet farther north, as shown by the X opposite "station 2," sights himself in line in two directions, and another level is taken. He continues to travel along the course as shown by the X's, setting the staff on the ground at every station, and allowing the levelman to take a reading. When he has got as far along course 0 as the levelman can read, which usually happens at about station 10, he crosses over to station 10 of course 1, and sets the staff every 100 feet, as shown by the o's, the levelman taking a reading in each case. When he has arrived at station 0 of this course, he crosses over to station 0 of course 2, and readings are taken along it up to station 10, and so on. Back and forth over the field the staff is set at distances of 100 feet until all around the level the