

shaping the bottom of the ditch to fit the tile. These, with a level, and careful work will be enough. If the sides of the ditch show signs of caving in, brace them with short pieces of board or plank and cross brace as shown in Figure 18.



FIGURE 16.
Finishing Scoop
for shaping bot-
tom of drain
ditch to proper
grade and of cor-
rect form to re-
ceive tile.

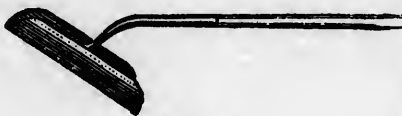


FIGURE 17.

Mile's improved
Draining Scoop
for removing
earth from the
bottom of the
ditch and pre-
paring a bed for
the tile drain.

Begin at the lower or down stream end of the ditch so that water will run out as you go along with your work. Do not open too great a length of ditch at a time; put your tile in place as you go along and cover it. It will then help to keep the ditch dry and will make your work easier. Be very careful to keep an exact grade as you go along; a succession of humps and hollows will cause your drain to clog and will in time ruin it.

GRADE OF DRAINS.

If possible give the bottom of your drain ditch a fall of at least six inches for each hundred feet of length. A fall of three inches will carry the water, but with light grades extreme care must be used in forming the ditch bottom to exact grade in every part, and the lighter you make the grade the greater will be the danger of a sluggish flow of water and the clogging of the drain.

SIZE OF DRAIN.

If poles, withes, or faggots are used (as they sometimes are when stone and tile are scarce or too expensive) they should be laid lengthwise in the bottom of the ditch to a height of not less than six or eight inches. The ditch should be six inches wide at the bottom, and the poles, withes or faggots should be carefully covered with sod, with the grass side down, before the ditch is filled. If stone is used, select flat pieces to form the opening, and make the cross section of channel at least four inches in smallest dimension. If tile are used, the proper size will depend on the length of the drain and the condition of the ground. If the drain is long, the soil wet and "springy," and the grade light, a five inch tile will be about right, and whether one or two lines of tile should be used must depend on the judgment of the roadmaker. Under ordinary conditions the following rule may be used:

For drains not longer than 1,200 feet use a 3 inch tile.

For drains 1,200 to 2,000 feet long use a 4 inch tile.