

During the next few years, most attention seems to have been turned toward the pin type roller spiker and there were a number of different types made and put on the market. The rigid spike in this type spiker made a much larger hole at the surface than it did at the end of the spike, so a roller spiker was developed with the spikes mounted on bars running lengthwise with the roller. The bars were loose at the ends allowing them to turn so the spikes would come straight out of the ground without tearing the holes larger at the surface. Light springs would pull the bars back in place as soon as the spikes came out of the ground.

#### **Hard Work by Hand**

The potato fork or the manure fork was introduced as a means of opening the soil to a greater depth to allow for good root penetration. A fork of this type can be forced into the ground to a depth of six to eight inches and by working the handle back and forth the soil can be broken between the fork holes.

This was the first type of cultivation used that worked the soil enough under heavy turf to allow air and moisture to penetrate deep into the root zone and really benefit the grass.

The next development along this line was the hollow tine fork. Briefly, this fork consisted of six hollow tines, 7/8 inches in diameter and 4½ inches long, tapered at the end and with a slot in the side of the tubing to eliminate plugging. The end of the tine is a solid band. The tines are spaced at 4 inch intervals. This type of fork cuts clean holes in the soil which will stay open indefinitely. They also allow for changing the structure of the soil by adding new material.

All forking work has one drawback: it is a slow process, hard work and rather expensive.

As we move along into the mechanical age, some one developed a machine known as the turferator. This machine consisted of two rows of drills spaced so they drilled 7/8 inch holes about four inches apart. It was operated by a motor. The drills were set with an automatic trip so they all went down at once. When they reached a depth of five inches, the trip released and the bits all came up at once and the whole machine moved forward four inches and the bits went down. This was a great labor saver; one man could do the work of six men with hand forks.

One of the more recent machines developed is the turf "Aerifier". The principle of this machine is the sub-surface tearing action produced by a series of spoon-shaped spikes mounted on individual discs and bent at a 30 degree angle for proper soil penetration. Depth of penetration of the spoons can be adjusted up to five inches by raising or lowering the supporting side wheels. The adjusting wheels can be set to raise the spoons clear of the ground for transporting the machine. Since each disc operates independently on the center shaft, there is very little tearing of the surface turf as spoons enter and emerge from the soil. As each spoon emerges from the soil, it removes a small core that is left on the surface. These cores can be broken up and distributed over the surface by dragging the area with a wire drag mat.

The most recent development is the Turf Saw. This machine has been developed in Kansas City by one of the local greenkeepers. It consists of a series of 10-inch saw blades mounted on a shaft spaced four inches apart. The saws are pushed in front of the machine which is propelled by a 20 horse-power gasoline motor. The saws can be raised out of the ground by means of a lever for turning the machine around, and by means of an adjusting lever, the saws can be adjusted to a depth of up to 5 inches. The notch cut by each saw blade is about ½ inch in width.

Primary purpose of this machine is for use on putting greens with the idea in mind that the saw notches would serve two functions: first, allow for the penetration of air and moisture, and second, that by cutting the notches from the higher to the lower parts of the greens it will also allow for a certain amount of drainage, in times of excess rain. The dirt removed from the trenches cut in the soil can be worked down and serve as a top dressing.

#### **U of Mass Turf Conference March 10-12, Amherst**

Annual turf conference at University of Massachusetts, Amherst will be held March 10, 11, 12, with Agronomy dept. of University and Mass. section, New England Turf conference, cooperating in presenting a practical program. Emphasized will be discussion of hidden costs in course maintenance for which increased demands of players are responsible.