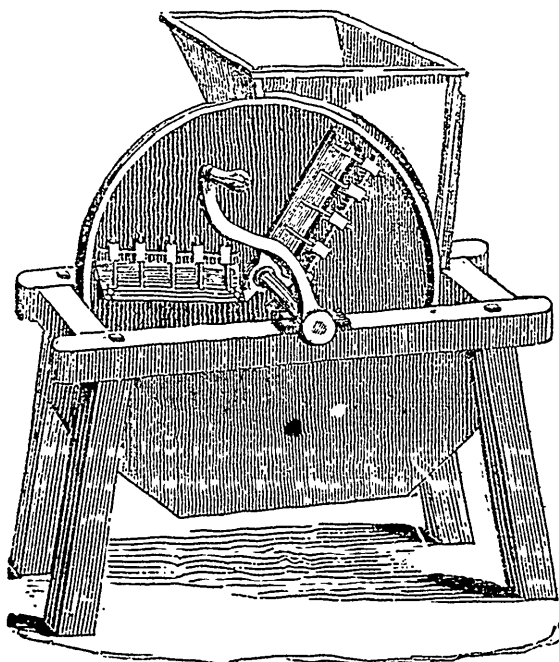


dry, the short tubes, which represented shallow drains, began to run first; but if water was again poured on the tubes before that previously poured on had all passed through, they began to drip again immediately that the second quantity of water was poured on, and without waiting for the water last used to pass through the soil. This was owing to the elasticity of the air confined between the free water at the bottom and that at the top of the column of earth, and in this case all the tubes, of whatever length, began to drip at the same moment. If, however, the tubes, after the first application of water, were allowed to remain some weeks, the short tubes discharged the whole of the free water, but the long ones, representing deep drained land, still retained a little free water at the bottom of the column of earth; and when water was again poured on at the top this free water was *immediately* discharged, or the deep drain began to run;—whereas the short tube, or shallow drain, having discharged all its free water, did not begin to drip for some time;—in fact, not till the water had percolated through the column of soil. This simple explanation seems fully to meet the case, and shows that there is no danger of making land too dry, as some have supposed, by deep draining. Every additional foot of earth ameliorated by the deep drain affords no less than 1200 tons of active earth per statute acre for the sustentation of plants.

### VEGETABLE CUTTER.



The cut represents a very useful machine for cutting roots for cattle. In England, where roots are in more general use than in this country, machines to cut, slice, and grate them, are in much request, and no little ingenuity has been expended on their construction. They are usually made of iron; most of them are complicated and costly. The cutter, represented in the figure, is on a good principle, and can be made for about \$12. The cutting wheel is made of cast iron, faced on one side, through which are inserted three knives similar to plane irons. These cut the vegetables into thin slices with great rapidity, and then cross knives operate to cut and break them into irregular

pieces of convenient form and size for cattle or sheep to eat, without danger of choking. This machine will cut one bushel per minute.