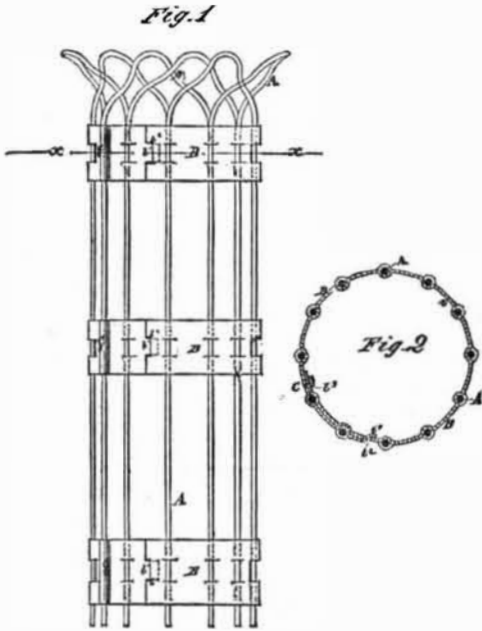


**IMPROVED TREE PROTECTOR.**

We publish an engraving of a tree protector which is intended by its inventor to furnish an efficient guard to the trunks of trees, and which is also easily placed, removed, and packed for storage and transportation. It is constructed of U-shaped wires, A, and straps of light sheet metal, B; the number of each depends on the required height of the protector. In the straps, B, at a suitable distance apart, are cut pairs of short parallel slits. The metal between the slits is bent outward to form a half round transverse groove, and inward to form a half round transverse groove. In this way are formed sockets to receive the wires, A. The arms of the loops or bends of the wires, A, overlap or interweave with each other. Upon the end of each strap, B, is formed a small tongue, *b*<sup>1</sup>, which fits into a short transverse slot, *b*<sup>2</sup>,

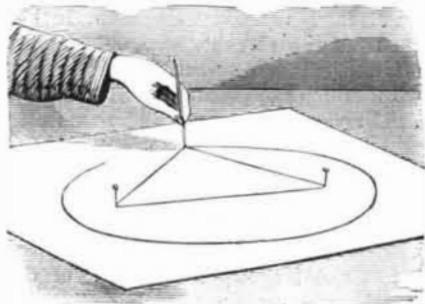


formed in said straps, B, near their other ends, as shown in Figs. 1 and 2. In the straps, B, at their square ends, and at a little distance from their tongued ends, are formed holes, *b*<sup>3</sup>, Fig. 2, in such positions as to coincide with each other when the ends are overlapped, to receive a short bolt, C, which is secured in place by a nut screwed upon it. The outer arm of the last wire loop at each end of the straps, B, overlaps the last arm of the loop at the other ends of the straps.

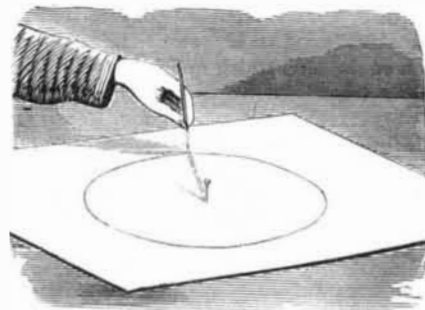
Patented April 7, 1874, through the Scientific American Patent Agency. For further particulars address Mr. Dwight Hitchcock, 34 Greene street, New York city.

**TO MAKE OVALS AND CIRCLES OF ANY SIZE.**

The following methods will be found convenient, in the absence of dividers or other instruments:



To make an oval, tie together the ends of a thread or string. Two pins arranged within the loop, as shown, govern the size of the oval, which is marked upon the paper by means of a pencil, carried against one side of the loop as indicated. The dimensions of the oval may be made larger or smaller, as desired, by enlarging or diminishing the size of the loop. Elliptical garden paths, flower beds, etc., may be accurately laid out in this way.



To describe a circle, attach one end of the cord to the center pin, and place the pencil in a loop at the other end. Then sweep the pencil around.

These methods are useful for cutting out picture ovals, patterns, and other purposes.

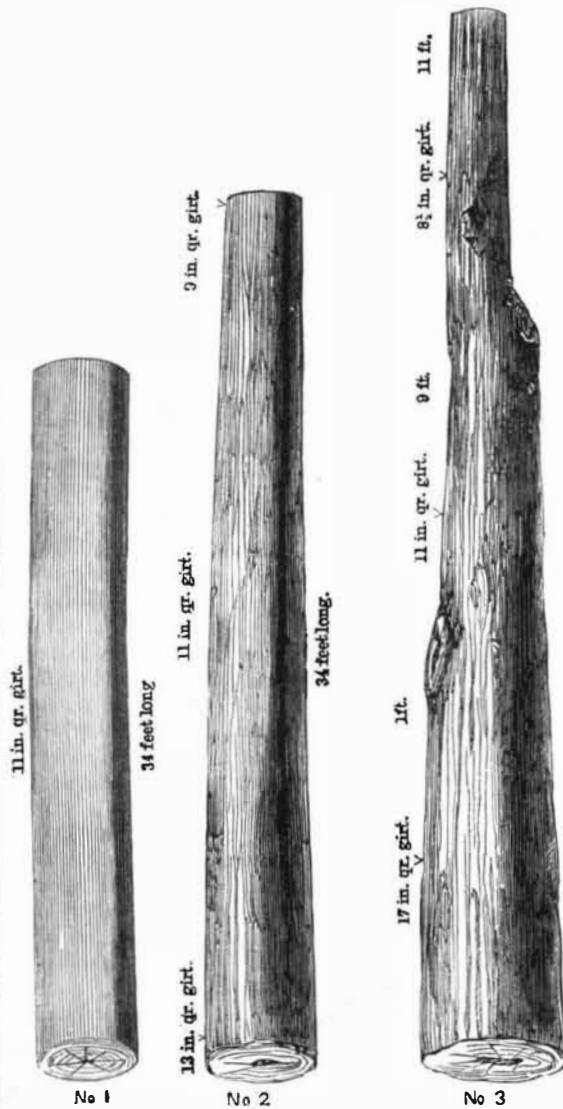
ENGLAND and the United States, according to the latest statistics, are the largest sugar-consuming countries in the world. In 1874 England consumed 830,000 tons, or about 57.2 lbs. per head of population. The United States in the same period used 770,000 tons, or 44 lbs. per individual.

To prevent hard soap, prepared with soda, from crumbling he bars may be dipped in a mixture of resin soap, beef tallow, and wax

**MEASURING BUILDING MATERIALS.**

Mr. Richard Horton publishes, in a recent work entitled "The Complete Measurer," the following practical application of his method of ascertaining the solid contents of a tree or similar body:

"Measure its length in feet by a rod, tape, or carpenter's rule, and then take its circumference in the middle with a piece of common whipcord, doubling the cord into four equal parts, and so apply it to the carpenter's rule, to learn the quarter girt in inches, with any fractional quarter or

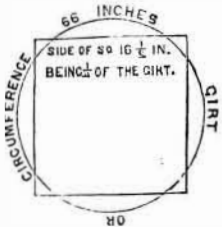


quarters of an inch that there may be. Or the circumference of the tree may be taken with a narrow, non-elastic painted tape, having spaces of four inches marked upon it, each space being numbered in successive rotation as girting inches, and every such space subdivided into four equal parts by a partial mark on the tape, to answer as quarters of inches. A purchaser will prefer using the whipcord, unless at the commencement of the tape three quarters of an inch is given in the measurement as an equivalent to him for the accustomed advantage obtained by the doubling of the whipcord to apply to the carpenter's rule to find the quarter girt of the tree. The tape, when passed round the tree, shows its quarter girt forthwith. These directions for taking the dimensions of a tree or pillar are under the consideration of its size being the same throughout, as instanced by the diagram No. 1; or of the tree or column tapering regularly from one end to the other, after the manner of the diagram No. 2. But when the size of a tree is not regular its whole length, in consequence of sudden variations in its circumference, each part or length of it so varying in girt must be measured separately, in conformity with the subjoined diagram, No. 3, and then the contents of the different parts added together. Having obtained the length and the quarter girt as directed, we refer to the top of the table for such quarter girt; and beneath it, opposite to the length of the tree found in the outward columns of the page, is shown the solid contents of the tree, or portion of the tree, as it may be.

Length. Feet.	Quarter girt. Inches.	Solidity. Feet.
14	17	35½
9	11	9½
11	8½	7
		52

Any part of a timber tree not girting 24 inches (that is 6 inches in quarter girt) is not usually considered timber, and is excluded from the measurement, unless by agreement to the contrary.

The annexed diagram of the transverse section of a tree, with its demonstration, is intended to exemplify the principle upon which the round timber table is compiled, and to represent how to acquire the true quantity of any round body, be its size what it may, as also to clearly show the construction of the square-sided timber table which Hoppus erroneously adopts for round timber."

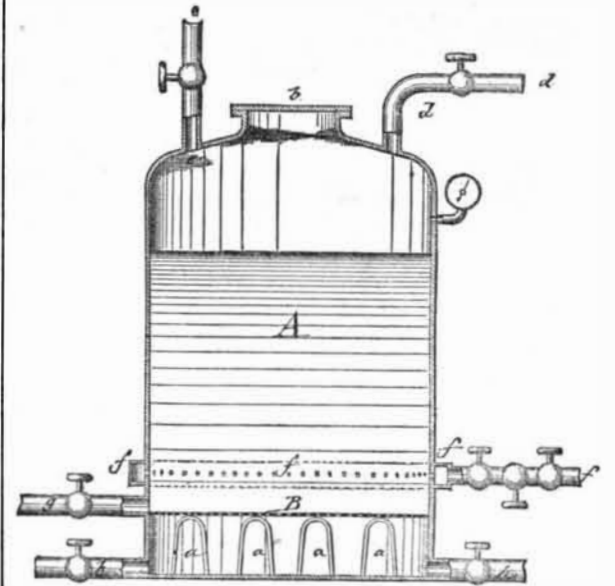


EVERY stone for grinding tools should be provided with a rest, and apprentices should be taught how to use it.

**IMPROVED SUGAR-REFINING TANK.**

We illustrate herewith a new process for refining sugar, in which the raw product is, when suitably moistened, subjected to the action of air at a high pressure, so that the air is forced into and percolates through the granules, effecting the bleaching and purifying the sugar before it is dissolved. A subsequent part of the process consists in admitting steam and water into the vessel or tank, to complete the purification.

In the engraving, A is the tank, constructed (together with its false bottom or horizontal partition) of such strength and material that a pressure of about 65 lbs. to the square inch may be exerted thereon. The false bottom, B, is perforated and provided with sieves, being placed at suitable height above the bottom of the tank, A, and stiffened by additional braces, *a*. The top part or side of tank, A, or both, may be provided with a manhole, *b*, for admitting the raw sugar,



the top of the tank being connected with the air-forcing pump by a pipe, *d*, at one side. A water pipe, *e*, of the top furnishes the water required in the treatment of the sugar. The tank is provided with a steam pipe, *f*, which surrounds the tank and admits the steam. An exit pipe and stopcock, *g*, below the steam pipe, *f*, admit the drawing-off of the solution of sugar, while pipes, *h*, serve as outlet pipes for the molasses or sirup. The degree of pressure is indicated on a manometer placed at a suitable point of the tank.

The raw sugar is filled into the tank and moistened, and a better quality of raw sugar, suitably moistened, placed on the top. The manhole and pipes are then closed, with the exception of one at the bottom below the sieves, and that connected with the force pump. The air-forcing pump is now set in operation, and the sugar exposed gradually to pressure.

The same tank is then made use of for the purpose of dissolving the sugar by admitting water and steam at the same time through the water pipe, *e*, and steam pipe, *f*.

When the purging of the sugar is complete, the air-forcing pump is continued in operation and dry cold or heated air forced through between the granules of the sugar, drying the same rapidly and carrying the evaporated moisture in similar manner as the sirup, through the lowermost outlet pipes.

Patented June 23, 1874, through the Scientific American Patent Agency. For further particulars, address the inventor, A. H. W. Schrader, Hoboken, N. J.

**Agricultural Work for March.**

The proper preparation of the ground, care of hotbeds, and sowing of hardy seeds will now occupy the gardener. Seeds of asparagus may be sown as soon as the ground can be worked, in drills a foot apart, and plants from seed sown last year may be set out. Put in rich soil in rows three to four feet wide, and a foot apart in the rows. Old beds ought to have a good dressing of rich manure. Sow beets, carrots, parsnips, and salsify early, in drills of fifteen or sixteen inches, and thin out as soon as they can be handled. Cabbage and cauliflowers from hotbeds, or wintered over, may be set out as soon as the ground is fit. Give them a good location, and keep them thoroughly worked. Sow celery as early as possible, and keep clean of weeds. Lettuce may be set out and seed sown for succession. As soon as the ground is tillable, onion sets may be planted and seeds sown thickly for sets for next spring's planting. They need a rich soil. Sow parsley seed in drills a foot apart, and keep clean. If the seed are soaked in warm water they germinate sooner. As soon as the ground can be worked, peas should be sown: make the drills pretty deep, cover with earth, and on top of this put fine manure. Put brush to them early. Potatoes for early use should be put in as soon as possible. Spinach may be sown now, and that sown last fall ought to be cultivated. Turnips may be sown as soon as the frost is out.

Hotbeds should be in order for sowing egg plants, tomatoes, and peppers to be set out in May. Melons, squashes, and cucumbers may also be started in them, a good way being to reverse pieces of sod and plant the seeds on them, as they are then easily moved, and, adds the *American Farmer*, have your seeds and tools all ready for the work now at hand.

A LITTLE camphene dropped between the neck and stopper of a glass bottle will render the latter easily removed if jammed fast.