

Hickory.

Some of our native woods cannot be equaled or be superseded by any foreign woods; in all our knowledge of natural history there has been found nothing possessing the excellent qualities of our native hickory. It is not, as commonly supposed, that good hickory must be grown in the north to be of the best; its habitat extends from the Green Mountains in Vermont, following the coast range, the Alleghanies, and the Blue Ridge through the Carolinas, and even to upper Florida. And, contrary to general supposition, the very best of the hickory used in the arts, where toughness is required, is obtained from North Carolina and eastern Tennessee.

"It is wonderful what toughness the hickory timber of that mountain region is capable of," said a wheel maker recently. "We can turn a piece completely around a circle without breaking a fiber." This, of course, after it is thoroughly steamed.

ERICSSON'S SUN MOTOR.

We illustrate the curious steam engine designed by Capt. John Ericsson, and built by him in this city in 1883, in which the use of coal is dispensed with, and steam power is generated by the heat of the sun. The generator consists of a large concave reflector, in cradle or trough form. The rays of the sun fall on this reflector, and are by it concentrated against the outer surface of the horizontal bar or heater, which stretches across and above the reflector. Said bar is hollow, and so are the side pillars that support the bar or heater; they are hollow, and contain water; they constitute in fact a portion of the boiler. When the hollow horizontal bar is highly heated by the sun's rays its contained water is converted into steam, by which the engine is worked. Such in brief is the construction of this novel and economical steam motor.

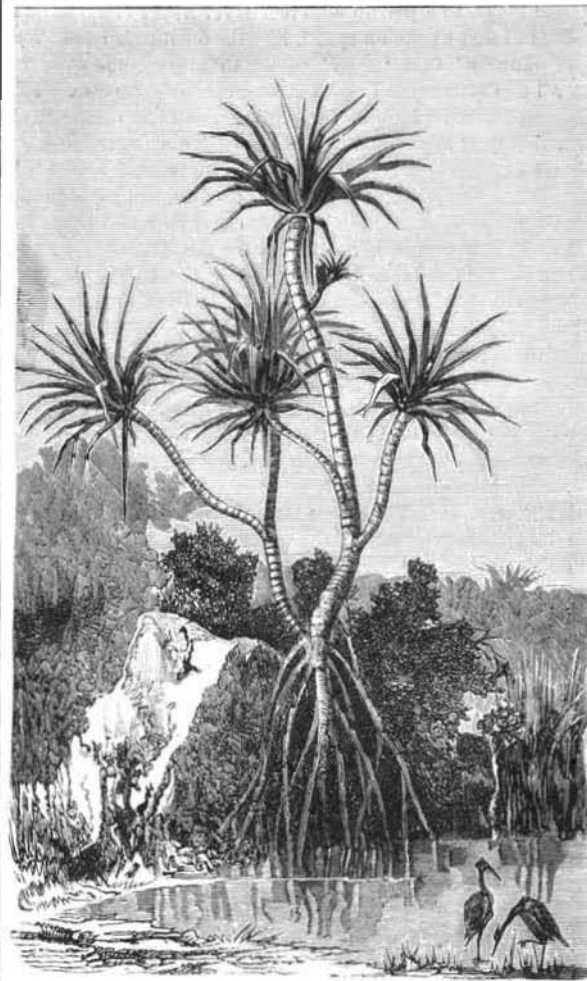
For tropical countries, and wherever sunshine is plentiful, this engine would seem to have great utility. The bottom of the rectangular trough consists of straight wooden staves, supported by iron ribs of parabolic curvature secured to the sides of the trough. On these staves the reflecting plates, consisting of flat window glass silvered on the under side, are fastened. It will be readily understood that the method thus adopted for concentrating the radiant heat does not call for a structure of great accuracy, provided the wooden staves are secured to the iron ribs in such a position that the silvered plates attached to the same reflect the solar rays toward the heater. Fig. 2 represents a transverse section of the latter, part of the bottom of the trough, and sections of the reflecting plates; the direct and reflected solar rays being indicated by vertical and diagonal lines.

Referring to the illustration, it will be seen that the trough, 11 feet long and 16 feet broad, including a parallel opening in the bottom 12 inches wide, is sustained by a light truss attached to each end; the heater being supported by vertical plates secured to the truss. The heater is 6 $\frac{1}{4}$ inches in diameter, 11 feet long, exposing $130 \times 9 \cdot 8 = 1,274$ superficial inches to the action of the reflected solar rays. The reflecting plates, each 3 inches wide and 26 inches long, intercept a sunbeam of $130 \times 180 = 23,400$ square inches section. The trough is supported by a central pivot around which it revolves. The change of inclination is effected by means of a horizontal axle—concealed by the trough—the entire mass being so accurately balanced that a pull of 5 pounds applied at the extremity enables a person to change the inclination or cause the whole to revolve. A single revolution of the motive engine develops more power than needed to turn the trough and regulate its inclination so as to face the sun during a day's operation.

The motor shown by the illustration is a steam engine, the working cylinder being 6 inches in diameter with 8 inches stroke. The piston rod, passing through the bottom of the cylinder, operates a force pump of 5 inches diameter. By means of an ordinary cross head secured to the piston rod below the steam cylinder, and by ordinary connecting rods, motion is imparted to a crank shaft and fly wheel, applied at the top of the engine frame; the object of this arrangement being that of showing the capability of the engine to work either pumps or mills. It should be noticed that the flexible steam pipe employed to convey the steam to the engine, as well as the steam chamber attached to the upper end of the heater, has been excluded in the illustration. The average speed of the engine during the trials last summer was 120 turns per minute, the absolute pressure on the working piston being 35 pounds per square inch. The steam was worked expansively in the ratio of 1 to 3, with a nearly perfect vacuum kept up in the condenser inclosed in the pedestal which supports the engine frame.—*La Nature.*

A BEAUTIFUL HOUSE PLANT.

The usefulness of large numbers of stove plants is due to their singularly graceful forms when young as compared with those of full sized specimens seen growing wild in the tropics, or here and there in large gardens where space is provided for the development of large growing stove plants.

**THE SCREW PINE (*Pandanus utilis*).**

Among palms, dracænas, aralias, and similar plants, we have many instances of this, so to speak, doubleness of character, and although many of these assume in the adult stage forms more or less attractive, it may be safely said that such plants are of little value for garden purposes, except when young. To this class of plants belong the Pandanuses, or screw pines. Travelers tell us how noble an appearance many of the screw pines have when seen luxuriating in groups, or in the form of large, weird-looking, isolated specimens along river banks or sea coasts, or crowning stony hills; the tall naked stem, from which long arm-like branches are produced near the top, and stretch out horizontally; the long stilt-like aerial roots, which, growing out of the branches, extend down to the ground, where they

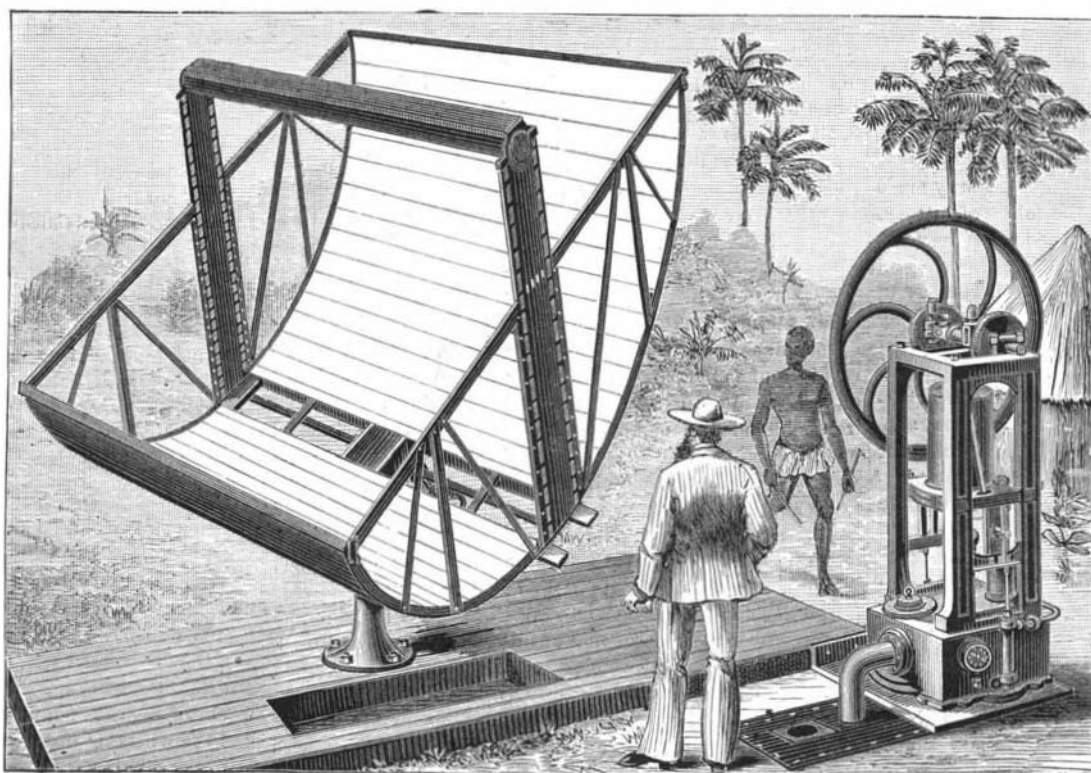
globose shrubs, sometimes growing out from a rift in the side of a rocky coast or mountain, or creeping by means of their snake-like stilts—the aerial roots—along the surface of the soil, until they become many yards in circumference. Such are screw pines "at home." As to their uses, they are almost as valuable to the natives as palms. Their pine-apple-like fruits are eaten in a variety of ways; the roots are used as ropes, and are made into baskets, mats, and hats, as are also the leaves, which are, moreover, used for paper making, nets, etc. In Mauritius the leaves of *P. odoratissimus* are made into bags, in which coffee, sugar, and grain are exported, and the "bases" used by fishmongers in this country are made from the sugar bags.

In the Palm House at Kew there are several gigantic specimens of *Pandanus*, the immense plant of *P. odoratissimus* being one of the attractions of the house, and perhaps the finest specimen of the kind in Europe. For horticultural purposes the screw pines are much valued in this country, only, however, in a small state. The most popular, perhaps, is *P. Veitchi*, a graceful variegated species from the South Sea Islands. Whether used for table decoration, or as an exhibition plant, this is always effective, and as it is easily grown and propagated, it has become one of the most frequently used among plants for decoration and exhibition.

Before the introduction of this species we possessed in *P. javanicus variegatus* our only variegated *Pandanus*; and if not so graceful as *P. Veitchi*, and less fitted for decorative uses, owing to the strength and sharpness of its spines, it still ranks second, its beautiful variegation being much more permanent than that of *P. Veitchi*, which is apt to "run out" when the plants get large. *P. utilis* is a dark green species with purple spines; it is quite as graceful as the variegated species and equally useful. The plant known as *P. candelabrum* must be referred to this species, as also must some of the screw pines, known in gardens under the names *sylvestris*, *odoratissimus*, and *media*. It is a native of Mauritius. *P. pygmaeus* is the *P. graminifolius* of gardens.

It is a pretty little plant, more like a *Freydenetia* than a *Pandanus*. The leaves are narrow, pale green, and edged with white spines. It branches when only a foot high, and continues to grow horizontally rather than in an upright direction. It is a native of Madagascar. *P. inermis*, a spineless, bluish-green leaved species; *P. Pancheri*, a broad leaved plant with white marginal spines and a flesh-colored keel; *P. decorus*, *P. ornatus*, and *P. Vandermeeschi* are other species cultivated in gardens, and all more or less ornamental when young.

It would be difficult to refer all our garden screw pines to their proper botanical position, the characters of young plants being so very different from those of flowering specimens. Being all natives of extremely hot countries, the Pandanuses will thrive only in our warmest stoves; they require plenty of water always, and grow well in a mixture of peat and loam, with a little sand added. The variegated kinds should have a light position close to the glass, in order to fully bring out their beautiful markings. In fact, all the species prefer a light position, although they thrive fairly well in a shaded one. We must remember that naturally they grow in very open places, seldom, if ever, occurring under the shade of trees.—*The Garden.*

**CAPT. JOHN ERICSSON'S NEW SOLAR ENGINE.**

ramify freely, and so afford safe anchorage to the tree against strong winds and heavy rains; the large sheaves of long sword-shaped leaves borne on the end of the branches—these are all characteristic features of the Old World tropics, and especially of the Mascarene Islands.

But screw pines are not tree-like in habit; we have the graceful little *P. pygmaeus*, the small unarmed *P. inermis*, and the bushy, variegated *P. Veitchi* and *P. javanicus*. These form either flat-topped, table-like plants, or dense

out. The doctors are complaining that they have nothing to do.

Hot Lemonade for Diarrhoea.

Some people prefer hot lemonade to the usual form, but it is only recently that we have seen it recommended in diarrhoea. Dr. Vigouroux recommends a glass of hot lemon-ane every hour, or half hour, as an easy, agreeable, and efficient treatment for diarrhoea.