

estimate is certainly too low, but in the absence of concentric rings it is, of course, quite impossible to fix the age of a monocotyledon with precision. The only method open is to observe the rate at which the tree grows for a given period, and compute the age by rule of three.

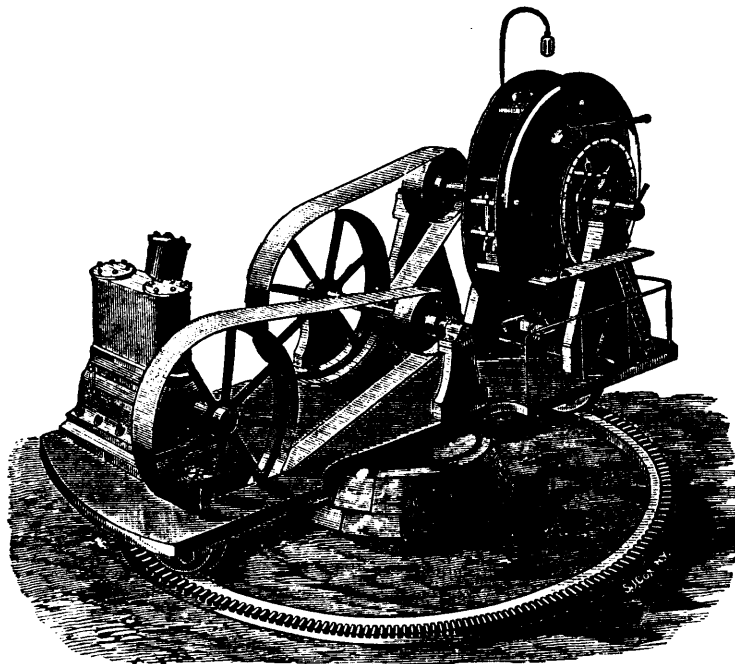
It is usual for beginners in botany to learn their first lessons from our common flowers, such as the wild rose, the buttercup, and the daisy, and it cannot be doubted that this is on the whole the best course. But still there is something to be said in favour of "beginning at the other end" when an opportunity offers itself for the study of some of the stranger and rarer vegetables, such as the banyan, the bamboo, the baobab, the *Rafflesia*, or the *Victoria regia*. And it is partly with the hope of inspiring some of my readers with a liking for botany that I have ventured upon so long a description of the habit and method of growth of the dragon-tree.—*Knowledge*.

artillerists entertain high hopes of the future of this type of gun.

W. E. Hicks, of 17 Broadway, New York, in the solution of this problem, has devised a gun for discharging shells carrying the high explosives, in which the actuating agent is centrifugal force. There is no limit to the quantity of this force that we can command by extremely simple mechanical devices, save and except the limit imposed by the tensile strength of the materials of which the discharging mechanism is constructed.

Mr. Hicks has applied this principle in a very simple and ingenious manner, as will be perceived from an inspection of the accompanying picture, in connection with the following description :

It consists of two steel disk wheels, placed concentrically side by side upon a shaft, to which is attached a pulley wheel for revolving the disks. It is necessary that these disks shall be



HICKS' CENTRIFUGAL GUN.

THE CENTRIFUGAL GUN.

The impression is very generally entertained among the best military authorities, that great advances in the science of gunnery are impending, which will have for their foundation the adaptation of mechanical devices for employing the destructive force of the modern high explosives—nitro-gelatine, gun cotton, the fulminates, etc., which, if it could be safely controlled, would add immensely to the efficiency of modern ordnance.

Such tremendous explosives, as is well known, cannot be discharged with safety from ordnance of the type at present made and used, for it has been proven that the rapidity of the expansive force of the slowest burning gunpowder will produce a percussion many times above the point at which the above-named explosive will detonate. It was to meet this grave difficulty that Capt. Zalinski constructed a gun in which the firing of the charge of dynamite is affected by subjecting the charge to a gradually increasing pressure of compressed air. The projectile in this gun leaves the muzzle at a high rate of speed, while the initial shock is comparatively slight—at least so slight as not to imperil those in charge of it; and scientific

rotated at very high velocity, as the acceleration imparted to the projectiles depends on this element. To enable the disks to resist the tendency to bursting, due to the very high speed of rotation, they are made thick at their centers and gradually taper toward their peripheries. Between the disks, and near their peripheries, are, at equal distances apart, four projectile carriers, which retain the projectiles when the gun is charged. These carriers are provided with automatic locking and unlocking doors, which firmly clasp the projectiles. These may be released at any pre-determined point in the rotation of the wheel. In practice the officer in charge gives the signal for pulling a lanyard. This unlocks an automatic apparatus holding the projectiles, and releases them at any given point in the revolution of the wheel, so that they can be thrown at any angle desired between the horizon and the zenith. The details of the carriers cannot be entered into further, since they are not exhibited in our picture.

By this principle, it seems quite clear, Mr. Hicks has reduced the element of danger of self-destruction from accidental explosion of discharge to the lowest possible quantity.