## THE FRINGED BIRTHWORT.

The fringed birthwort, of which we take our illustration

tropical America; in North America, Europe, and India a few are found. Many of these plants attain too great a size to be easily cultivated, and the generally dingy color, together with their disagreeable odor, render them undesirable. The leaves of the fringed birthwort are characterized by the nerves being surrounded on the upper surface by whitish zones, this coloring being due to the presence of a film of air under the epidermis. The outside of the perianth is greenish and the interior brown-purple crossed with greenish veins. The half-climbing stems grow from 1 foot to 2 feet long, and the flowers are produced in July and August. Being a native of Brazil, it grows best in a warm house.

## A CURIOUS HYBRID.

Our engraving represents a curious family, consisting of an African zebra, an Abyssinian ass. and their hybrid foal. The young animal resembles both parents, its color being grayish inclined to fawn, and its legs showing very clearly the zebra stripes. The crossing of the zebra and the assis in accordance with the law that the most frequent and most useful forms of hybridity occur between different species belonging to the same genus. The horse, for example, will breed with the ass, the zebra and the quagga; the dog has been certainly known to breed with the wolf, and probably with the fox; the goat with the sheep, the ram with the roe; and it has been comparatively easy to obtain hybrids from the union of the rabbit and the hare.

As a rule however hybrids are not fertile. Thus the mule does not reproduce itself, but is only obtained by a repetition of the union of the ass and the mare. Between horse and ass, however, there is a wider gulf than between the zebra and ass, and therefore the chances of the hybrid of the latter having the faculty of reproduction are more favorable.

It was noted that the period of gestation in

longer than that of the mule. The animals are at the Berlin Zoölogical Garden.

We are indebted to the London Sporting and Dramatic News for our illustration.

A Decorative Process,

painting on panel, applicable to interiors of houses of a su-The latest and one of the most successful efforts in art de- perior class. The work we saw was done on oak and pitch from The Garden, is one of the large genus Aristolochia, of coration we have seen has been introduced by Mr. Aldam pine; and for the decoration of paneled work it is extremely which there are 200 species. The greater number come from Heaton, of Bloomsbury square, who has applied hand paint- suitable. One panel on pine was an admirable rendering in a naturalesque spirit of the oak and mistletoe,



this case extended to 111 months, or about fifteen days ing in a way that will find favor among architects and | with the subject and the labor bestowed. One imtheir patrons desirous of favoring the art decoration of in- mense gain in this kind of art decoration is that it cannot teriors, in contradistinction to the "manufacturing" pro- fall into the hands of indifferent or manufacturing decoracesses. Having seen some of Mr. Heaton's work, we can tors, as its value consists in the high class hand work of explain it simply by saying it is a kind of raised or gesso the artist.-Building Neros.



There is a remarkably pleasing solidity and

A CURIOUS HYBRID.

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## Cop Waste,

noticed the large amount of waste made from weft, gener- year. ally called "cop bottoms." We are mostly met by the reply that this cannot be helped, and that, though excess is punished, a certain amount is inevitable; still, from what shuttle, which, in most cases, is still in a primitive condiwe have seen, we are of opinion that the average amount of tion, and has not been improved upon during the last fifty cop bottom waste is too much, and might, if properly looked years. From what we have shown above, it will be seen into be much reduced. It is our intention in this article to that the careful insertion of the tongue of the shuttle would inquire into the cause of so much waste, and to see whether and how this could be removed.

When we look at the way a cop is formed on the mule, a few hours previously-had left the cop. where every layer of the yarn has a different position, where these layers are constantly crossing each other, and thus kept from getting entangled, it looks, at first sight, the simplest thing in the world to unwind this yarn down to the last turn, and yet such is not the case. True, the yarn, after the cop has been placed upon the tongue of the shuttle, is steadily drawn through the eye which faces the point of the shuttle tongue; but though the eye and this point always retain the same position, the relative positions of this point and the yarn where it comes from the cop are constantly varying. When the cop is fully, the angle from the and the spring brazed on also by hand, the whole a clumsy circumference of the cop to the point of the spindle is a and unmechanical contrivance. Why cannot this tongue be greater one, while the turns of the yarn round the tongue made of, say, rolled steel, and the tongue attached in such a are fewer than when the cop is nearly finished; thus there manner that the whole is turned out by a machine, even and has been devised by Messrs. Peter Rundquist and Theodore is more strain upon the yarn in the latter case than in the smooth, and in such a condition as corresponds with the Angelo, of New York city. A vessel with antiseptic liquid former, and any obstacle which prevents its unwinding is present advanced state of mechanics? We think when this is supported on clamps on a main pipe, and connected by a of so much greater effect. When the yarn in the mule is tongue has to take the place of the mule spindle, which is flexible conduit with the spray tube for raising and dissipatwound upon the cop, it is guided by the faller wires, which highly polished and finished, it should, at least, not be in- ing the liquid in the usual manner. are in close proximity to it, and give it support, but when ferior in finish to the latter. being unwound in the shuttle, there is no such assistance, and all the pull emanates from the point of the shuttle, chester Chamber of Commerce, on the 29th of last month, which sometimes is three or four inches off. There is also that we must have greater economy in production if we are this difference between the winding on and the winding off to hold our ground; a saving of 8s. per year per loom is not of the yarn, that in the former case the spindle turns, and much, but is still a matter important enough to be seriously the yarn is more passive, while in the latter the shuttle considered, especially when we know that with many weavtongue is fast, and the varn is active. Still, there seems to ers the amount of waste is more than stated above. be no reason why moderately strong yarn should not unwind to the last turn if the cop could be placed into the shuttlemakers to make researches with a view to improving shuttle exactly the same way as it was in the mule: but, the tongue, for we regard it as our mission to contribute from what we have seen, we believe the cause of the waste our mite in every possible way to the continued progress of to lie in this direction. If, in putting the cop upon the the textile industries and everything connected therewith.shuttle tongue, one or more of the internal layers of yarn Textile Manufacturer. are displaced, they must, to a certain degree; entangle the yarn there, and thus produce an extra strain, which causes the yarn to break; and we know that, though the small remaining part of the cop might sometimes be easily unwound, it is easier for the weaver to pull it off. and throw it into the waste box. It, however, often occurs that the lower or inner layers are considerable displaced, so that a larger re- ing the blasting material. The improvement consists in the scrapers may be dumped automatically at any distance maining part of the cop cannot easily be unwound, and thus cutting blades arranged in guides in the drill stock in con- from the back. By this device the men attending the scrap form a large amount of waste.

the shuttle tongue seems, therefore, to be the main cause of end piece, and be again withdrawn into the drill stem by the waste; but how is this produced ? Naturally in putting the action of the spring when the drill is drawn back. the cop upon the tongue. But we ask again, Is there any necessity for this displacement, or cannot the same be liam A. Sitton, of Cleburne, Texas. The spindle has a cir- These pipes, coming in contact with submerged torpedoes, avoided ?

tendency to pull it off; rather the reverse; but in the shuttle there is a constant drag, which would take the cop at once slipped on it, being interposed between its shoulder and the System, invented by Mr. W. P. Barclay, of Virginia City, off the tongue if it was not held by some means. This is shoulder of the sleeve or box. The nut which holds the Nevada, is to provide an economical means of raising water mostly accomplished by supplying the tongue with a bowspring, which presses upon the inside of the cop, and thus spindle and around which is formed a receive de- are used in the mine or shaft as may be required to lift the prevents its slipping from the tongue. As the tongue with tachable rings. By removal of one of the rings at each end water. These are placed one above the other, and connected so its spring must of necessity, when expanded, be of larger of the spindle, the box may be adjusted on the latter to as to divide the pressure between them. Twoseries of pumps diameter than the inner aperture of the cop, it stands to rea- compensate for wear. son that a certain amount of force is required to push this tongue into the cop, the middle of the spring being higher M. Marshall, of Knoxville, Tenn., is opened and closed by shaft. The discharge pipe of the lower pump delivers the than both ends; this force causes friction, and displaces means of a jointed and spring-acted treadle depressed by water to a receiver, from which the suction pipe of the next easily any layers of the yarn which in packing or removing the foot of the fireman, the treadle working a slide block pump above takes it, and it is delivered to another receiver, of the cops may have got loosened.

generally takes the cop in her left hand, and, holding the fording a quick method of opening and closing furnace by Mr. Thoro W. Greenleaf, of Westborough, Mass., conshuttle in her right, screws the tongue into the cop. It thus doors. often happens that the lower end of the cop is compressed, and a part of it carried a little inside, which makes it quite; pump, in which is combined a pump with a motor for oper-oven wall there is a burner and reflector. impossible to unwind this part of the cop. It is true that, ating the same, as to permit of the storage of power in the with great care, the weaver can avoid, to a certain extent, motor and afterwards allow it to be expended for the opera- Dudley and John Anderson, of Petrolia, Cal. It consists of this displacement of the yarn, but such extra care can hard- tion of the pump from time to time as occasion requires. a handle attached to the saw by binding straps entering rely be expected of her when we consider the little time she In attaining this end a set of spur wheels is arranged in a cesses of the saw blade, and being secured to the handle and

ence between 9<sup>1</sup>/<sub>4</sub>d. and 3<sup>1</sup>/<sub>4</sub>d.., a saving of 2d. per loom per Many times in walking through weaving sheds have we week, or £1 13s. 4d. on 200 looms per week, and £84 per

> We think we are not wrong in ascribing a large share of this waste to the imperfect construction of the tongue of the be much facilitated if the former was perfectly smooth and even, and of the diameter of the spindle which-often only

> There is a tongue, patented some years ago by Messrs. Butterworth and Brooks, in which, when it is turned up for receiving the cop, the spring lies quite flat against the spindle, thus passing easily into the cop, and in which the spring only bends out when the tongue is depressed into the shuttle with its cop on. This tongue has many advantages, but still is not so generally used as one would expect, and there must, therefore, be disadvantages, or, perhaps, prejudices, with which we are not acquainted. But the ordinary tongue is, in our opinion. still very imperfect; it is forged by hand,

Mr. Hugh Mason mentioned at the meeting of the Man-

We have thrown out these hints to induce our friends the

## New Mechanical Inventions.

James A. Albright, of Fayetteville, Lincoln county, Tenn., has patented a supplemental rock drill designed to be the hole at the bottom to form a large chamber for contain-The displacement of the lower and inner layers when on laterally from the stock of the drill by the impact upon the saved.

cular shoulder or boss near its inner and larger end, and a cause the explosion of the same without injury to the While the yarn is on the spindle in the mule there is no screw hole is tapped in its outer end. A should ered sleeve, vessel. or box, fits over the spindle, and detachable rings are also box on the spindle has a tap that screws into the end of the from mines and deep shafts. As many pumping cylinders

and moving a spiral groove of the shave or pivot rod of the and so on until it reaches the top of the shaft. In order to facilitate the insertion of the tongue the weaver door. It will prove an invention of value to engineers, af-

chamber and the closing of the main valve by the pressure of the water. The water supply is easily regulated by a screw plug, and any hammering is prevented.

Ralph K. Ent, of North Topeka, Kan., has patented a Millstone Balance. The millstone is fitted with a number of symmetrically arranged horizontal guide tubes with adjustable weights, and a separate number of symmetrically arranged vertical guide tubes and adjustable weights for adjusting the standing and running balance of the stone without one interfering with the other. The stone may thus be kept balanced with little trouble.

Mr. Simeon Duck has recently obtained a patent for im provements on the Mortising Machine previously patented by him (December 21, 1875). The new feature is the segmental gear which rocks upon a journal on the main shaft, and on which the table tilts while sliding freely upon it. This materially simplifies the invention.

In a new Lift Pump, Mr. Augustus Johnson, of Morristown, Ill., constructs the plunger, and also the check valve box, with two valves, all four valves opening upwards. The object is to use auxiliary valves which will check or trap the the water drawn into the cylinder and prevent it from flow ing back.

A new Steam Atomizer, for impregnating the air of surgical operating rooms, hospitals, etc., with antiseptic vapors,

A new Ironing Machine, patented by Mr. Henry Monk, of Troy, N. Y., embodies numerous novel and ingenious features. The shirt, the front of which is to be ironed, is first clamped and tautened in a suitable device. It is then carried under rolls which are heated and rotated in different directions, and then returned under said rolls and polished.

A new Machine for Rolling Tubes and Bars, devisea by Messrs. J. O. Butler and Ambrose E. H. B. Butler, cf Kirkstall Forge, Leeds, England, is an improvement on similar devices patented in England by J. Robertson, December 20, 1869; by G. W. Dyson and H. A. Hall, October 31, 1870; and in the United States by Jacob Reese, June, 1867 A prominent feature of the invention consists in the use of a table or rocking frame on which the bars are placed after leaving the machine, and on which they are made to roll forward and backward while cooling to prevent warping, and to keep them true.

Mr. Samuel T. Shankland, of Laramie, Wyoming Terriused after the ordinary drill, for the purpose of enlarging tory, has improved on his Steam Plowing and Scraping Attachment to Cars, which he patented April 24, 1877, so that nection with a spring-seated end piece, so as to be projected ers have merely to fill them, and thus time and labor is

In order to Protect Vessels Against Torpedoes, Mr. John H. Fisher, of Mount Washington, Ind., proposes to surround A new Carriage Axle Box has been patented by Mr. Wil- the hull with a series of pipes to be filled with air or water.

The object of a new Hydraulic and Wire Rope Pumping are employed, the piston rods being connected by wire ropes: A Furnace Door for Steam Engines, patented by James and a hydraulic engine is located near the mouth of the

A new Oven Lamp for illuminating bakers' ovens, devised sists in an adjustable tubular bracket to which an oil reser-Jacob S. Baker, New Freedom, Pa., has patented a lift; voir is connected, outside the wall of the oven. Inside the

A new Saw Handle has been patented by Messrs. J. N.

has for copping the shuttle. An ordinary cop of 42's weft, suitable case and geared so as to be driven either by a heavy saw by a clamp bolt, with lower crosspiece and uppersecond weighing about 200 grains, contains about 1,010 yards of coil spring or weight. To one of the rotating shafts of the handle, or by a fastening nut.

yarn. If we take a 45 inch loom, making 40 inch cloth, and gear wheels is attached outside of the case a disk and wrist Mr. Wiley J. Johnson, of Hernando, Miss., has patented running 200 picks per minute, and allow one third for stop- pin, which latter through a connecting rod reciprocates the a new Gin Saw Filing Machine, by which the files may be pages, we have a consumption of 134 picks per minute of pump piston, the latter being made hollow and bent around readily adjusted to the saw teeth at the proper distance and 40 inches each, or 150 yards of weft; at this rate a cop lasts into a spout at the top, so as to form a conduit for the wa- inclination, so as to produce the most favorable action in the 64 minutes ter from the cylinder of the pump tube, which is located be- down strokes, and exert a less pressure in the up strokes.

Assuming that a weaver minds three looms, each consum- low in the well. To compensate for the increased work of ing the same quantity of weft, we have three changes of 'the motor on the upward stroke in lifting the hollow piston a Car Starter which is an improvement upon the device in shuttles in 61 minutes, or a little over 2 minutes per loom, full of water, a counterbalance is employed on one of the which a ratchet wheel upon the axle is combined with a segincluding piecing of warp-ends and all other eventualities. shafts to render the action of the motor uniform, and to We cannot, therefore, be hard with the weaver if she per- start and stop the action of the same a detent is employed. forms the operation of putting the cop upon the shuttle in a A Watercloset Valve invented by Paul Magnus, of New chet to turn the axle at a greater advantage of leverage. hurried manner, and necessarily injures the cop. A large York city, consists of a valve operated by a center stem and production of cloth is more important to her than a little having two interior valves, a larger one to open or close the has been invented by Mr. Nickolaus Betz, of St. Ingbert, more waste, but it is not so to her master. We find that on main supply pipe, and a smaller one to supply or discharge, Germany. It avoids the use of sulphuric acid, and consists an average, weavers, when moderately careful, make from in connection with suitable channels, a water chamber inter-essentially of a claw guide and a set of vertical and horizon-3 to 6 per cent of waste in 42's cops. This waste is sold at mediately between the larger and smaller valves. The center tal stretching and cleaning rolls, over which the wire is about 3id. per lb., while the yarn costs about 9id. If now stem acts on the smaller valve, removing the pressure of drawn to be cleaned of scales on all sides. The wire is then a weaver makes per loom about 12 ozs. of waste, and this water from the larger valve, permitting it to open. The passed through a box filled with a mixture of calves' hair could be reduced, say one half, it would give at the differ- closing of the small valve secures the filling of the water and sand.

Mr. William H. Lynn, of Freeport, Ill., is the inventor of mental lever carrying a weighted pawl and a chain arranged about the segment to cause the pawl to engage with the rat-

A new Machine for Scaling, Cleaning, and Polishing Wire