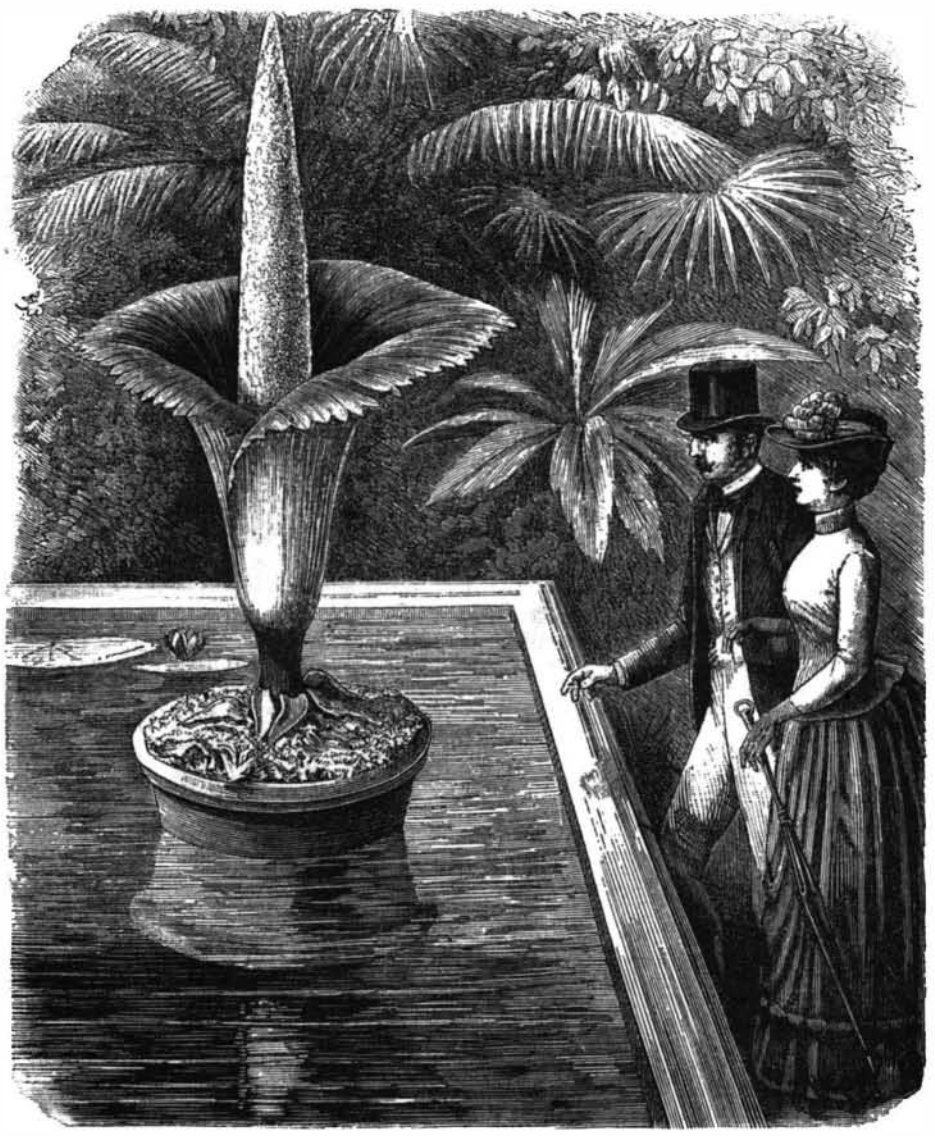
A GIGANTIC PLANT FROM SUMATRA.

(Amorphophallus Titanum.)

In the year 1878 the well known Italian botanist and explorer, Beccari, discovered, on the island of Sumatra, a gigantic plant belonging to the Arum family, and which attains a height of about 10 feet there. From seeds which Beccari brought back to Europe, some young specimens were raised in the Botanical Garden at Florence, one of which was sent to England and was cultivated in the celebrated Botanical Garden at Kew. In the course of the year this exotic reached a remarkable size, being nearly 6 feet high. Our illustration gives a correct ideaof the immense plant, which, as the reader will see, has a spathe similar to that of the wake robbin and our so-called leaf plants. From the spathe rises the great spadix bearing the flowers.

On Sumatra, another gigantic plant (*Rafflesia Arnoldi*) also grows, the open flower of which measures fully three feet in diameter. These plants are parasites growing on the roots of wild vines in places where the ground is enriched by elephant manure. When the buds break through the wood of the vine roots they are no larger than a walnut, giving no hint of the great size of the future flower. Gradually, however, these buds attain the appearance and size of a head of white cabbage. About this time the outer leaves, which envelop the flower, turn back, and the latter appears. It has five large holes which surround the middle cup-shaped part. The Rafflesia described has not been found outside of Sumatra. On Java, Borneo, and the Philippine Islands there certainly are Rafflesias, but they do not attain the size of the plant which is a native of Sumatra.—*Illustrirte Zeitung.*



THE GREAT LILY OF SUMATRA.

The Smallest American Railway.

The most diminutive railroad in all Down East, according to a newspaper exchange, is that owned and operated by the Monson, Maine, Slate Co., running from the company's quarries to Monson Junction, on the Bangor and Piscataquis. This little road has a 2 ft. gauge, is about 6 miles in length, and is thoroughly equipped with locomotives, passenger, baggage, and freight cars, has several stations, regular time tables, and a superintendent. The superintendent is also conductor, baggage master, mail agent, passenger and freight brakeman, news agent, and director—a regular Pooh Bah—and for performing all these offices he gets $900 a year. Ten men constitute the entire force of the road. The trains average about 50 miles a day in summer and 25 miles in winter. The road is all down hill one way, so that a car will run from the quarries to the junction without the assistance of a locomotive. If a passenger misses the regular train, $5 will secure a special to carry him over the line. Last year this toy road carried 9,000 tons of the company's freight to Monson Junction (6 tons to a car) for transshipment over the Bangor and Piscataquis to Bangor and points west, and 4,200 passengers, who paid $12,000 in fares, were transported at a cost of $9,000. This little road has been in operation six years, and in all that time no accident of any kind has occurred on its line. We judge it to be the smallest independent line running regular trains for both freight and passengers in America.

Artificial Musk.

The first French journal which gives any particulars of the artificial musk is the *Journal de Pharmacie d'Alsace-Lorraine.* In a recent issue this paper says: Artificial musk is a chemical product appearing in crystals of a yellowish white color and of a strong musk odor. For perfumery purposes the crystals should be dissolved in alcohol, with the addition of a trace of ammonia or carbonate of ammonia. This solution, which may be compared to tincture of musk, surpasses the latter in the intensity and penetrating power of its odor. The product to be used in perfumery must previously be diluted in a homeopathic manner. The following are the rather loose details of the manufacture of the article which have been deposited with the German Patent Office: "Boil in a reflux condenser toluol or toluene, C_7H_8, with one of the following halogen compounds of butyl, viz., chloride, bromide, or iodide of butyl, along with chloride or bromide of aluminum. The resulting product falls back into the water in the still, where it is decomposed and is distilled in a current of water vapor. The parts which distill between 170° and 200° are collected separately, and treated with a mixture of nitric and fuming sulphuric acid. The product obtained from this process is washed in water and redistilled in alcohol, from which the 'artificial musk' crystallizes out." The patent rights for France and abroad have been disposed of to a syndicate of manufacturing perfumers. There is no doubt that the trade in natural musk, so far as the perfumery branch is concerned, is threatened with a very serious crisis. The use of musk in medicine is very restricted, the article being now only employed in certain cases of typhus.—*Chemist and Druggist.*

The Speed of Vessels in the British Navy.

In recent years naval officers have made themselves heard as regards the constructive details of our war ships viewed as fighting machines, and in none have they been more emphatic than in that relating to speed. The purport of their argument has been that, if a vessel has not a preponderating influence in armor and guns to enable her to give battle with some chance of success, she should certainly be provided with a high speed to show a clean pair of heels if desirable. It was no easy task to move aside the antiquated notions of the Admiralty in this respect. Other powers were, however, so pronounceably ahead of us on this question, that example and argument at length prevailed. Fast cruisers of 18 knots and higher speeds were built, and have met with all the success that was to be expected from them. Why this important factor of naval construction was neglected for so long was, and is still, a mystery to outsiders. Yet, when put to the test, we out-distance our competitors, and probably possess to-day the fastest ships of any navy. Premising, then, that speed is the first element of safety that an unarmored man-of-war can possess in a critical moment, and ranks before roominess, sail carrying power, or handiness, of which we used to hear so much in the past, how comes it that several small vessels have been built lately to crawl along at a top rate of 12 knots on a trial trip? True, these vessels are small—800 to 1,000 tons only; but they would seem to have been designed for peace purposes, fishery duties, river work, and for being kept on show instead of use were war to break out. Do the responsible authorities think enough has been done for the national honor, with all the confidence reposed in them, when attention is paid only to the leviathans in the service, and are the small craft beneath their notice? The great success that torpedo boats have had proves that moderate sized vessels may be made to travel at a pace unknown to us twenty years ago. There is, therefore, no doubt that vessels of say 180 ft. long can be driven at much higher speeds than that quoted—in fact, there are examples to prove this in foreign navies. How comes this apparent retrograde step, then, at a time when the country has been so lavish in its expenditure on its fighting fleet? We are very much afraid the answer is the old one for which public departments are noted in every country—viz., red tape. This word may be said to embrace everything that may be included with love of tradition, circumlocution, and general desire how not to achieve results. Perhaps the British government excels all others in the capacity of requiring to be goaded before it can make perceptible progress.

Let us consider for a moment what low speed in an unarmored man-of-war really signifies. Take, as an extreme case, an ordinary cargo boat, with no protection and no propelling power. In the presence of an enemy's cruiser she would be inevitably captured at once. It would seem to the uninitiated mind that a ship without armor is very much in the same category as the merchantman, and to be of any value as a guard she ought to have the power for a surplus speed and the latest ordnance. It will be seen that this rule applies more to the cruiser type than to line-of-battle ships. In the former case we have a class that would be employed in time of necessity as patrols and convoys, and thus our merchant navy would be relying on a myth were the question of speed left out of consideration. That swiftness in a scout is a *sine qua non* goes without saying. What, then, with no want of funds at our disposal, can be the object of putting our officers and men at a disadvantage if they should be called upon to do their duty to the country? It is difficult to find any answer except the one we have given. To attack or defend at will, to keep the sea for a length of time, to overcome bad weather, and be an efficient protection to commerce, means, in a few words, large engine power; but our board of Admiralty reverses the ruling of the saying that "to be at peace we must be prepared for war," and sends to sea war ships prepared for peace only, as far as speed is concerned. Officialdom reigns supreme, and the public is hoodwinked. Even a tyro at marine design will know that, as we have torpedo boats of 120 ft. long steaming at over 20 knots, vessels of a substantial build may be propelled at more than 11 to 12 knots with ordinary draught. If the type taken be that which has obtained in the service in the past, the result is inevitable; but, with the experience that has come to us during recent years, most of the shipbuilding firms of the country would readily make themselves answerable, on a displacement of 1,000 tons, for a speed of 16 or 18 knots. The remark that such a vessel would be all engines and ordnance is beside the mark, for a vessel of this kind is a weapon of offense and defense, and it is absurd, if nothing else, to furnish a war ship worthy of the name with anything short in either of these necessary vital elements. It may be said that our constructors do not have the direction of the leading features of a design in their hands. If this be the case, why does not a protest go forth against unnecessary interference? The public look to be well served, and will, if a catastrophe occur, not be slow to fix the responsibility on the shoulders of individuals. It can be easily understood that a catastrophe is within the bounds of probability if, in the present state of marine engineering, a man-of-war can only take her place in the line of battle having a speed of 12 knots as developed on a trial trip.—*Industries.*

Nevada's Salt Mountains.

The salt mountains located on the banks of the Rio Virgin, an affluent of the Colorado River in Lincoln County, Nev., cover an area of twenty-five miles, extending to within seven miles of the junction of that stream with the Colorado. The salt they contain is pure and white and clearer than glass, and it is said that a piece seven or eight inches thick is sometimes clear enough to see through to read a newspaper. Over the salt is a layer of sandstone from two to eight feet thick, and when this is torn away the salt appears like a huge snowdrift. How deep it is has not yet been ascertained, but a single blast of giant powder will blow out tons of it. Under the cap rock have been discovered charred wood and charcoal, and matting made of cedar bark, which the salt has preserved, evidently the camp of prehistoric man.

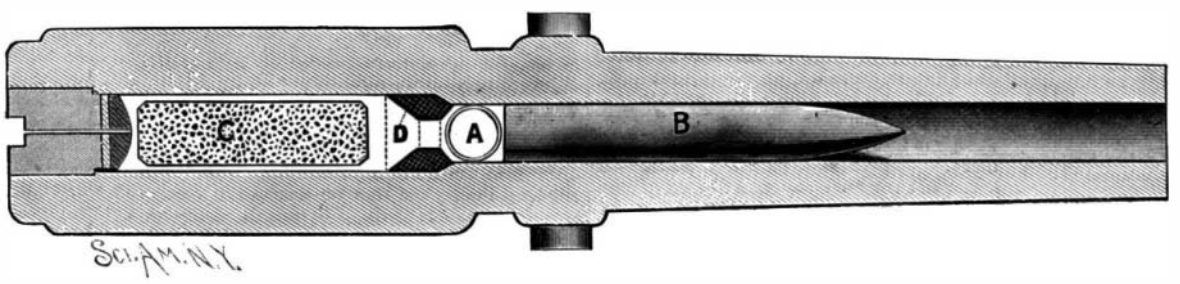
A FATAL explosion of an oxygen cylinder occurred on the 23d January at the Rosehill works of the Scotch and Irish Oxygen Company, Polmadie. While the foreman was in the act of carrying a cylinder, it unaccountably exploded with great force, injuring him fatally. Portions of the cylinder were afterward found a quarter of a mile off, although fences had to be penetrated in their flight.

The Strength of the Limpet.

Some interesting results of a naturalist's inquiries are sent to the London *Daily News* by Mr. J. Lawrence-Hamilton, who says that, in proportion to its size, the limpet is probably the strongest of known animals, excepting the Mediterranean *Venus verrucosa*, a cockle-like creature, which pulls 2,071 times its own weight when out of its shell. "At Folkestone, by means of accurate appliances," says Mr. Lawrence-Hamilton, "I found that the common seashore limpet, which, deprived of its shell, weighed a minute fraction less than half an ounce, required, when pulled according to its plane of adhesion, a force exceeding 62 lb. to remove it from its powerful grip upon the local littoral low tide rock, or upward of 1,984 times its own dead weight. The superficial area of the base of this individual limpet measured 2·4 square inches. Taking the atmospheric pressure at 14·7 lb. to the square inch, this would even then only account for 35·28 lb., or little more than half the power exercised in the air by this sea snail, which, acting upon immersed objects in the water, would, of course, have pulled a much greater weight than that of 62 lb. Thus, in the air, a limpet pulled up to 33 lb., but subsequently, in spite of its previous fatigue, when covered by the incoming tide, it then took upward of 54 lb. to remove it. I doubt whether the limpet's adhesive force has anything to do with the question of atmospheric pressure. In other experiments, even bits of rock came away sticking to the limpet's embrace. An ancient Greek author compared this animal's adhesion to the ardent attachment of an ugly old woman to a handsome youth. In carrying out my experiments upon the limpets, I was ably assisted by the eminent practical scientific naturalist, the Hon. Walter Rothschild." The same correspondent says: "The force required to open an oyster appears to be 1,319½ times the weight of the shell-less creature."

A NEW GUN FOR FIRING HIGH EXPLOSIVES.

We give an illustration of a new method of loading and constructing ordnance, lately patented by Mr. L. Gathmann, a Chicago manufacturer. The object of this invention is to facilitate the throwing of large masses of high explosives a long distance, to effect which highly compressed carbonic acid gas is placed in a cylindrical case, A, between the projectile, B, and the powder charge, C, this non-combustible gas being designed to protect the shell from heat and also act as a cushion, thereby protecting the projectile filled with high explosives from any severe shock. The invention further consists in placing a ring, D, against a specially constructed shoulder in an enlarged powder chamber. This ring, D, is made of celluloid and has a center opening considerably smaller than the inner bore of the cannon. In discharging such ordnance the ring, D, is designed to retard, in the first moment, a great amount of the powder pressure, so that the full force cannot act at once upon the projectile, but will give a slowly starting and gradually accelerating propulsion. The opening of the ring quickly enlarges, being made of strong but very inflammable material, and before the projectile leaves the muzzle of the gun the ring almost entirely disappears. By this method the action of the gunpowder is converted in the first moment into a pushing power on the projectile, without, however, losing any of its force, it being designed that the shell or projectile shall get as much pressure before leaving the muzzle of the gun as if the ring, D, and case, A, were not inserted. The shell of the projectile or torpedo can be made very light, as it is thus protected from shock and heat, thereby giving room for large quantities of high explosives. By this method it is claimed that eight inch ordnance can throw a shell containing over one hundred pounds of the most powerful explosives a further distance than has heretofore been possible, so that one shot properly directed would sink any ironclad afloat. During the last few years large sums of money have been expended by foreign powers in perfecting torpedo boat service, but the most perfect torpedo of to-day yet leaves much to be desired. By this invention it is claimed that a torpedo containing almost any desired amount of explosives can be thrown several miles. Pneumatic guns have heretofore taken the lead in this field, but they have thus far been adapted for only a short range fire, while, if this invention fulfills the requirements claimed by the inventor, all modern ordnance can be converted into guns for firing high explosives.



SECTION OF GATHMANN'S GUN FOR FIRING HIGH EXPLOSIVES.

A NEW TARGET PISTOL.

It is more difficult to tell why the majority of boys are naturally so fond of shooting than it is to say why parents are so averse to the practice. Certainly, shooting, especially target shooting, is a pleasant and profitable pastime, as it affords discipline for the mind and eye, exercise for the muscles, training for the nerves, gives opportunity for the display of skill, and provokes healthy and stimulating rivalry.

The record of any Fourth of July is sufficient to show that firearms, even of the cheaper sort, are not safe in the hands of children and youth. This remark might properly apply to air guns also, as they are far from being safe in careless hands.

HARMLESS PISTOL.

Inventive genius has lately produced a device which is as practical as harmless. It is not only safe as far as the operator himself is concerned, but it is incapable of harming spectators or surrounding objects. The harmless pistol consists simply of a barrel, a spiral spring placed in the barrel, a stock and a trigger. The principal novelty lies in the projectile, which consists of a rod of wood having upon one end a soft rubber cup and upon the opposite end a metallic ferrule provided with a flange, which is engaged by the trigger when the projectile is inserted in the pistol barrel. This projectile is called the "vacuum tipped arrow," on account of its ability to adhere to the target when forcibly projected by the spring of the pistol.

The target consists of a varnished sheet of cardboard, provided with the usual conventional ring and figures. The best effects are secured when the target is placed against the wall with a slight padding, such as a folded newspaper, interposed between the target and the wall. As a permanent arrangement, the addition of three or four sheets of blotting paper to the back of the target, with a retaining sheet of pasteboard, all fastened together by means of paper fasteners, has been recommended.

Reducing His Salary Saved Him.

A contemporary relates the following in support of small salaries: A Philadelphia clerk says his life was saved by having his salary reduced. He was employed as bookkeeper at $1,200 a year, but for some cause was thrown out, and afterward went to work for $750. "At that time," he says, "I was thin and weak and couldn't walk a mile to save a dollar. At any rate, I thought I couldn't. But when my income was so fearfully reduced I found it absolutely necessary to economize, and I did so by walking home from my work, a distance of about five miles. It pretty nearly killed me at first. Then I began to enjoy it. Within three months I was walking both ways, and I've kept it up ever since. Ten miles a day, summer and winter, unless during a hard storm, and look at me. One hundred and eighty pounds, the appetite of an ostrich, and not a day's sickness in ten years."

THE first canal grain receipts of the season arrived at New York May 6, in the steam canal boat William Spencer. She had 7,100 bushels of wheat, and made the passage from Buffalo in seven days and five hours.

Valuable Instructions for Engineers.

The Eclipse Pump Manufacturing Co., Cincinnati, have published the following valuable instructions to engineers. To young and inexperienced persons the directions given are of practical value and should be heeded.

1. The first duty of an engineer, when he enters his boiler room in the morning, is to ascertain how many gauges of water there are in his boilers. Never unbank or replenish the fires until this is done. Accidents have occurred, and many boilers have been entirely ruined from neglect of this precaution.

2. In case of low water, immediately cover the fire with ashes, or, if no ashes are at hand, use fresh coal. Do not turn on the feed under the circumstances, nor tamper with or open the safety valve. Let the steam outlets remain as they are.

3. In case of foaming, close the throttle and keep closed long enough to show true level of water. If that level is sufficiently high, feeding and blowing will usually suffice to correct the evil. In the case of violent foaming, caused by dirty water, or change from salt to fresh, or *vice versa*, in addition to the action above stated, check draught and cover fires with fresh coal.

4. When leaks are discovered, they should be repaired as soon as possible.

5. Blow down under a pressure not exceeding twenty pounds, at least once in two weeks—every Saturday night would be better. In case the feed becomes muddy, blow out six or eight inches every day. When surface blow cocks are used, they should be often opened for a few minutes at a time.

6. After blowing down, allow the boiler to become cool before filling again. Cold water pumped into hot boilers is very injurious from sudden contraction.

7. Care should be taken that no water comes in contact with the exterior of the boiler, either from leaky joints or other causes.

8. In tubular boilers the hand holes should be often opened, and all collections removed from over the fire. Also, when boilers are fed in front and blow off through the same pipe, the collection of mud or sediment in the rear end should be often removed.

9. Raise the safety valve cautiously and frequently, as they are liable to become fast in their seats and useless for the purpose intended.

10. Should the gauge at any time indicate the limit of pressure allowed by the inspector, see that the safety valves are blowing off. In case of difference notify the inspector.

11. Keep gauge cocks clear and in constant use. Glass gauges should not be relied on altogether.

12. Under all circumstances keep the gauges, cocks, etc., clean and in good order, and things generally in and about the engine and boiler room in a neat condition.

Blowing up a Masonry Wall.

At a recent meeting of the Institute of Marine Engineers, Mr. Joseph Thomas described the method used in removing the old dock wall at the new entrance of the Royal Albert Dock. The basin, which it was found necessary to enlarge, was surrounded on all sides by walls 38 feet deep, 20 feet wide at the bottom, and 5 feet at the top, made of concrete, composed of six parts gravel and one part Portland cement, equal to granite in hardness and strength. The ground was made up to the level of these walls and quays, and warehouses formed thereon.

Several schemes were proposed for carrying out the undertaking, which were explained by Mr. Thomas, but the plan adopted and carried out with every success consisted in using explosives fired by electricity. The effect of closing the circuit was remarkable. The entire visible length of wall was instantaneously lifted in the air in a perfect line about 6 feet, a crackling roar, a cloud of brownish smoke, and a violent surface displacement of the water in the immediate neighborhood of the wall was the only visible effect of the vast forces let loose below. So instantaneous was the effect that the chairman of the dock company, who closed the circuit, declared the wall fell to pieces before his hand struck the switch.

POISON IN CELERY.—Dr. Charles M. Cresson, of Philadelphia, states that he has more than once found the typhoid bacilli in the juice that he has squeezed out of celery grown near Philadelphia.—*Annals of Hygiene.*