

ENGINEERING INVENTIONS.

Mr. James M. Thayer, of Randolph, Mass., has patented an improvement in elevators by which they will be stopped and prevented from falling should the hoisting apparatus break or in any manner become disarranged.

Mr. John H. Blake, of Batavia, N. Y., has patented a cheap rotary engine that consists of few parts and is economical in the consumption of steam. The invention consists of an adjustable abutment, and a spring and crank shaft for effecting the movement of the abutment, and a rotary valve of simple construction.

An improved pile driver has been patented by Mr. Joseph W. Putnam, of New Orleans, La. This invention relates to an improvement in the class of pile drivers which are adapted for use in the construction of railroads, being for that purpose mounted on a truck or platform car in such manner as to admit of lateral movement in the arc of a circle, so as to drive several piles successively without requiring any change in the position of the truck or car.

Dika Bread.

The following interesting note concerning the preparation of the dika or odika bread of Western Africa has recently been received from Dr. H. W. Bachelor, in the Gaboon, by Mr. Thomas Christy, to whom we are indebted for it:

"The plums are gathered as they fall from the tree, and are emptied from the baskets one after another until a large heap is formed. They are allowed to remain many days until the outside has putrefied, and then the nuts are cracked, the seeds or kernels taken out and smoked for many days. Then they are put into a large mortar and crushed into a homogeneous mass. The rays of the sun are now allowed to pour on the mass, which melts and is put into a mould. This mould is of the shape of a frustum of a cone, and the cakes vary in diameter from eight inches to a foot at the base. These will keep for six months."

Dr. Bachelor also makes the following interesting remarks with regard to the native medicinal plants of the country:

"The only way of ascertaining the properties of any product here is to ask the natives 'if it poisons goats,' or 'if the monkeys eat it,' and by direct experiment. The natives themselves know nothing of one medicine for one disease, and another for another. It is, in their opinion, the *witch-craft* that cures, not the leaf itself."

LIFTING TACKLE.

Every engineer, builder, and millwright knows the great importance that is attached to lifting heavy weights and fixing materials and machinery. It is no use for work to be properly finished if accidents happen in fixing. The young and inexperienced erector is frequently at a loss to know how and where to attach his ropes and other appliances to secure the best result, and, worst of all, no effort is made to teach him; he must rely entirely on his own observations. So well known is this ignorance with respect to lifting and hoisting in mechanical trades, that it is frequently stated, and often acted upon, that an old sailor makes the best erector. He is as nimble as a monkey on a pole or scaffold. We know very well that in our younger days we experienced considerable difficulty in obtaining information respecting knots, loops, and other rope fastenings.

No doubt all who have to do with the moving of machinery and other heavy masses will find the rope knots and fastenings shown in the engraving very useful. The information is not only useful when away from home in foreign countries, or away from the workshop, but it is useful in the workshop. The man who understands the use of rope tackle is a king among his fellows.

We have often thought that in these days of steam cranes and hydraulic jacks, men are not so ready in resources as they were many years ago. They trust too much to machinery and too little to themselves. They seem afraid to exert their real strength at the end of a rope. If we can only induce a few of our readers to study the art of lifting weights and encourage confidence in manual strength, we shall not consider our efforts to have been in vain. The various kinds of knots and loops are shown in the annexed engravings.

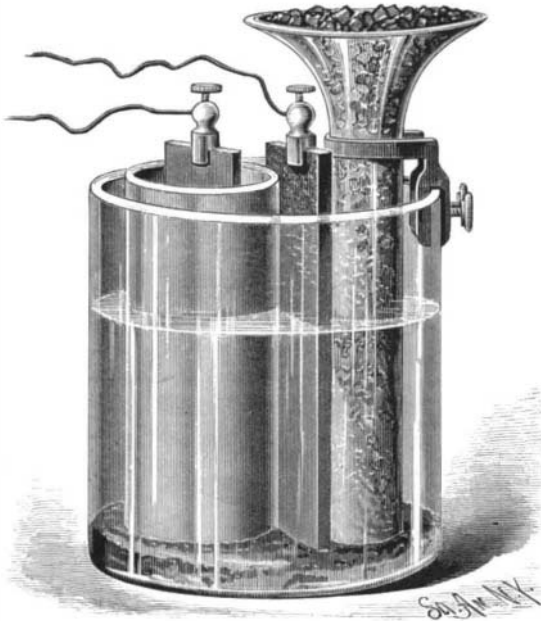
The Fastest Time in a Trotting Match.

On the closing day of the Jockey Club meeting, in Chicago, July 24, the best time ever recorded in an actual trotting match was made by the chestnut mare **Maid S.**, owned by

William H. Vanderbilt. The time was 2 m. 13½ sec. for the mile. Rarus has trotted in exhibition trials against time in 2:13¼ and 2:13½, and St. Julien in an exhibition trial in 2:12¾.

IMPROVED GALVANIC BATTERY.

In the battery shown in the engraving the ordinary zinc and carbon elements are employed, the zinc being placed in the porous cell and immersed in a solution of muriate of ammonia, and the carbon in oxalate of chromium and potash in combination with free bichromate of potash and muriatic acid.



ANDERSON'S GALVANIC BATTERY.

The negative portion of the cell may be charged in various ways, as for instance, by placing in the muriatic acid any oxalate, such as oxalate of copper or of ammonia, and adding bichromate of potash, whereby oxalate of chromium and potash is more or less quickly formed in the cell: but the mode the inventor has found advantageous to adopt is to add oxalic acid to a solution of bichromate of potash until effervescence ceases, and then to slowly evaporate the solution, whereby crystals of the oxalate of chromium and potash will be obtained. A sufficient quantity of this salt is then placed in the bottom of the carbon cell, together with about an equal quantity of crystals of bichromate of potash and muriatic acid, either pure or more or less diluted with water, according to the strength of the solution required, and the carbon is then placed in this solution. Instead of dropping the crystals or other agents loosely into the cell

the power of the battery, as more crystals are then exposed to the action of the solution. In this way, by adjusting the depth to which the tube is immersed the strength of the battery is regulated.

For a one-fluid battery the oxalate of chromium solution is common to both zinc and carbon. Arranged in this way the action of the battery, although of much shorter duration than when two fluids are used, the battery will be rendered much more intense, and the internal resistance of the cell will be less. The two-fluid form of battery is employed where great constancy, combined with a certain degree of power extending over a considerable period of time, is required, as, for instance, for telegraph work, the ringing of electric bells, and for the driving of electro-motors and the production of the electric light. On the other hand, the one-fluid form of battery may be used with advantage for purposes where a short, steady, and powerful action is required.

To prevent the escape of the fumes usually arising from the acids the solutions are covered with a film of oil or with a layer of finely powdered charcoal.

This battery was recently patented in the United States by Mr. Robert C. Anderson, of Woodgreen, England.

NEW INVENTIONS.

Messrs. Jacob Hollinger and John Flinner, of Millersburg, O., have patented improvements in that form of gate which, instead of swinging horizontally on hinges, is fixed upon a horizontal pivot bolt at one end between two posts, and is connected with rods and levers, whereby the gate is turned vertically over on its end when it is to be opened.

Mr. George K. Shryock, of Johnstown, Pa., has patented a dinner bucket the cover of which is provided with a glass lined sauce holder, preferably made in cup-shaped sections, which are made removable.

Mr. John Clayton, of Brainerd, Minn., has patented an improvement in rolling colters, which has for its chief object the exclusion of dust and dirt from the friction surfaces, thereby preventing wear of the journals, so that the durability and efficiency of the colter, as a whole, are increased. The inventor also provides for taking up such frictional wear as is unavoidably incident to use, and for supplying lubricant to the friction surfaces.

Mr. Jacob Katzenberg, of New York city, has patented an improvement in the class of suspenders in which a cord is combined with shoulder straps by means of pulleys or sliding attachments, so as to allow the free movement of the button pieces, and thereby accommodate the movements of the body of the wearer.

Mr. Thomas Ragan, of Philadelphia, Pa., has patented a non-freezing hydrant that can be disconnected from the water main and removed for repairs or other purpose without digging or excavating about it.

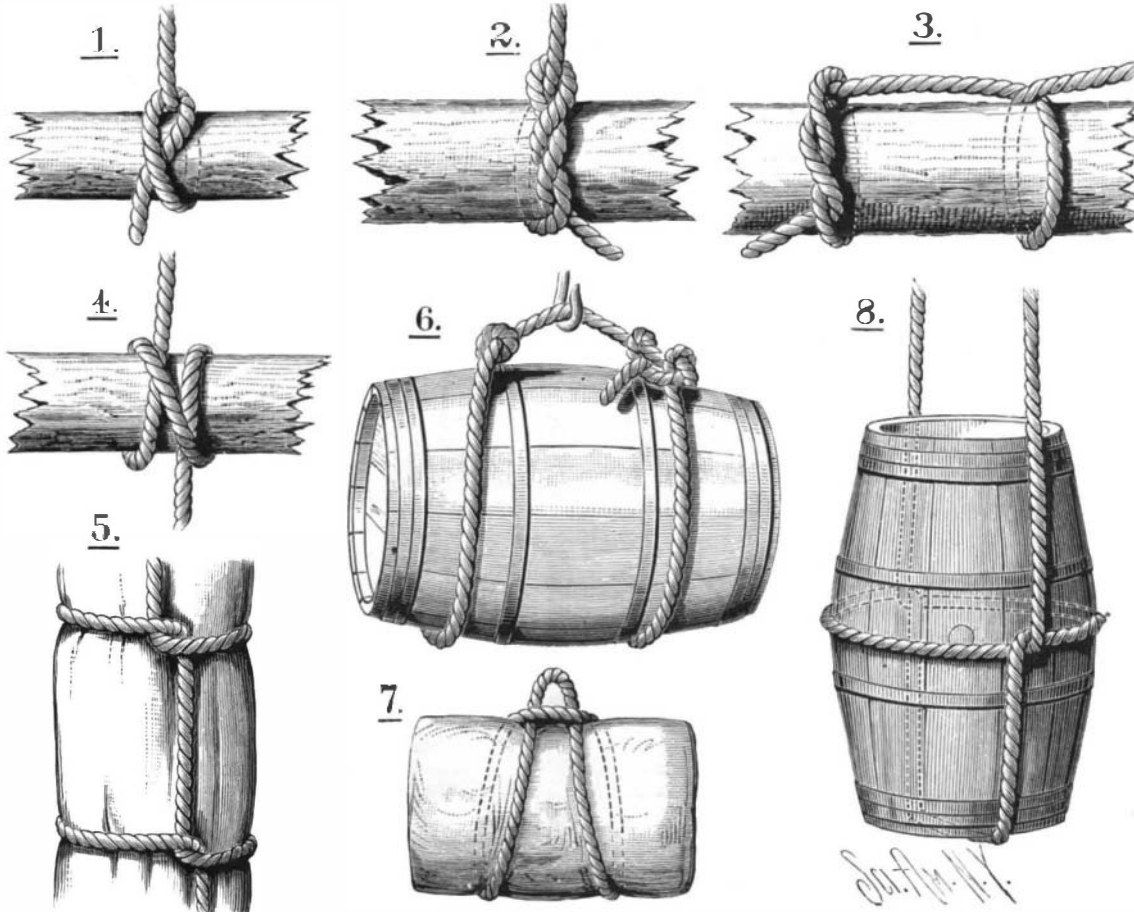
Mr. George Milbank, of Chillicothe, Mo., has patented an improved method of reducing grain or other substances, consisting, essentially, in subjecting the material under treatment to the action of reducing disks and an air current simultaneously, the air current passing between the disks and conveying the reduced material in opposition to the centrifugal action.

A metallic awning, so constructed that it may be folded compactly against the front of buildings and readily extended, has been patented by Mr. Wm. P. Woodruff, of New York city. The invention consists in a set of overlapped top strips, sets of overlapped end strips, and connecting and suspending chains and rod.

Messrs. Nicholas C. N. Laurence and Ernest G. Matzka, of Detroit, Mich., have patented a process of applying gilding or bronzing powders to mouldings, consisting, first, in mixing the gilding or bronzing powder with a solution of chlorine, alcohol, turpentine, diluted acetic acid, or any liquid compound with which the powder can be incorporated; in then adding thereto glue, isinglass, gelatine, or other soluble adhesive substance, and in then applying the mixture with a brush.

Mr. Henry Hartman, of Salt Lake City, Utah Terr., has patented an improved bridle, which is so constructed that horses can be easily and quickly controlled should they become frightened or attempt to practice ugly or dangerous tricks.

A novel device that may be attached to sewing machines for plaiting the fabrics to be sewed in plaits or folds of any desired width or any desired distance apart, has been patented by Mr. Leopold Lyon, of Hazleton, Pa.



Figs. 1, Half Hitch. 2, Timber Hitch. 3, Half Hitch and Timber Hitch. 4, Clove Hitch. 5, Hammock Hitch. 6, Cask Sling. 7, Bale. 8, Butt Sling on End.

LIFTING TACKLE.

containing the negative solution, as has been generally the practice, the strength of the battery is regulated by inclosing the crystals of bichromate of potash in an adjustable glass tube, open at the top and having a bottom of perforated platinum or of platinum wire gauze, or the tube itself may be perforated either at the bottom or sides. This tube is immersed in the negative solution to a greater or less depth. The greater the depth of immersion of the tube the stronger