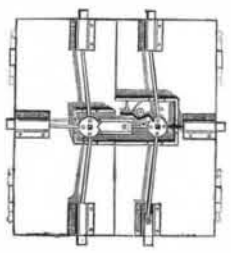
RECENT INVENTIONS.

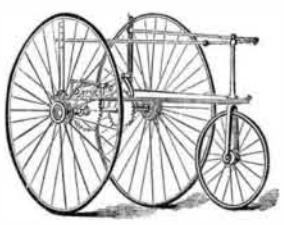
Door Bolt.

This is an arrangement of bolts, wheels, or disks and rods, in which the wheel of one part of a double door has an angular recess formed in its side to receive the angular end of a bolt of the wheel of the other part of the door, so that the bolts of one part of the door will be locked by the bolts of the other part of the door. In the bolt operating wheel is formed a recess to receive the end of a locking lever, held against the wheel by a spring to adapt the bolts to serve as outside fastenings. This device is applicable to safe, vault, and other strong doors, as well as to ordinary doors. It is also equally well adapted to single and double doors. This useful invention has been patented by Mr. Charles Clark, of Smyrna, Tenn.



Improved Velocipede.

This is an improved arrangement of foot treadle mechanism for applying the power for propelling velocipedes and other vehicles. An improved arrangement of steering apparatus is also included in this invention. Ratchet wheels are placed on the axle of the driving wheels, and pawls are connected with the foot treadles, so that the treadles will act on the axles through the ratchets and pawls, instead of cranks, as commonly arranged. By this means dead centers are avoided, and the wheels may continue to run when the treadles have ceased to act, allowing the operator to stand on them without working the machine, thus saving the trouble of stepping off in any case when it may be preferred to allow the machine to continue its motion by momentum or otherwise. This arrangement enables the operator to govern his action to suit his preference with respect to the throw or range of his tread. Mr. William B. Denton, of Wichita, Kan., is the patentee of this invention.



Baby Jumper.

This consists of a wire suspending device forming a neat, simple, and efficient seat frame, back rest, and arm supports, together with an arrangement of seat body adapted to the frame, the whole making a very convenient, neat, and inexpensive jumper. It will be seen that by the bow shape of the wire loop, the seat falls directly under the point of suspension and thus balances properly, and also that by such form of the wires the seat is more accessible than when suspended by hangers of cords and other devices falling in straight lines. The device is made by simply shaping a single wire. When the child is seated securely in the jumper, and when the spring is not forcibly expanded to raise and lower or "jump" the child, the elasticity of the spring will give the jumper all the advantages of an easy chair for the comfort of its occupant. The device is neatly made and japanned or nickled. The inventor furnishes a simple attachment for young babies to sleep in, which can readily be applied to the jumper. This invention has been patented by Mr. M. M. Raymond, Corry, Pa.

Eosine Photo Plates.

At a recent meeting of the Photographic Society of France, M. Vidal exhibited his experiments with gelatino-bromide plates containing eosine. These plates were prepared by MM. Clayton and Tailfer. The sensitiveness to certain rays has been greatly modified by employing the eosine, especially for the yellow.

The isochromatism, without being perfect, is progressing by the means proposed. We can now obtain the respective value of violet, blue, green, and yellow rays. As to the red rays, they are still refractory, but it is to be hoped that ere long they will be subdued, so as to give every satisfaction to artists, who will then be enabled to see their pictures reproduced by photography with all the real effects of light and shade.

M. Vidal gave a warning to the Bank of France that it is now very easy to imitate their bank notes by means of eosine plates. He (M. Vidal) had reproduced a bank note in a very satisfactory manner by covering the note with a very thin film of yellow gelatine. The blue lines of the bank note are of a bluish-yellow tint and are very non-actinic, whereas the yellow comes out admirably, and the negative leaves nothing to be desired.

M. Gobert, an official of the bank, followed M. Vidal through all his explanations, and said that this subject merited all the attention of the governors of the Bank of France.

M. Lugardon, of Geneva, was present at the meeting, and exhibited some very remarkable instantaneous proofs of birds, dogs, horses, and other animals. The developer which gave him the most satisfaction for these instantaneous pictures is that of Herr Wild, which permits the development to be continued for more than half an hour without inconvenience.

Dr. Eder says that the formula of Herr Wild is very good, and that he obtained by its agency more softness and detail in the shadows than by the use of potassium bromide. Herr Wild takes 1 gramme of iodine and dissolves it in 200 c. c. of alcohol; he then adds 200 c. c. of water to the whole. Five to ten drops of this solution are added to the 50 c. c. of the ordinary oxalate of iron developer.

Dates.

The date is the fruit of the *Pœnia dactyfera*, the Byled-el-Djerid of the Arabs. The palm date has a naked and cylindrical stem; it grows in Asia and in certain provinces in Africa, and is abundantly used by the natives, and is as indispensable to them as the cocoanut to the savages of Oceanica.

The flowers of the date are inclosed in a long spathe and change into an oblong fleshy fruit, yellow in color, of which the thick skin is readily preserved by drying. It incloses a cylindrical, deeply furrowed nut, hard and corneous, which contains an oily and sugary substance. Each date tree carries a variable number of clusters, and these in maturity attain a length of about a meter, and a weight of ten or twelve kilogrammes. When the fruit is to be preserved, it is gathered before reaching maturity and dried in the sun. Their cultivation requires fresh water and a hot sun. There are more than thirty varieties of dates, among which the male date, *dakkar*, or *menakker*, is pre-eminent. All these varieties have the same botanical characters, their trunks resemble the underground stems of ferns, their leaves are pinnate and luxuriant. Dates are planted in two different ways: the first consists in sowing the seed and transplanting the tender shoots at proper intervals, the second in planting the young buds which appear at the foot of the adult tree or grow from the axils of the leaves.

The palms and their congeners belong to the warm regions of the earth; they are found in India, Persia, etc. In Europe their sole representatives are the *Chamærops humilis*, and the cultivated date palm, whose fruit does not ripen naturally. The date is common in Spain, where it is cultivated upon a great scale for its fruit. The tree grows extensively in Provence; there are numbers at San Remo, at Bordighiera, and in their vicinity; they are cultivated principally for their palms, which are bleached and which are also sent to Rome and throughout Italy, to be used in processions through Holy Week. The Jews also use them at the festival of the Passover.

The gathering of the dates takes place in autumn, two or three times, and is over in three months. They are divided into three sorts according to their state of maturity. Exposed to the sun upon mats they become at first soft, then fill with a juicy pulp, then thicken and are no longer liable to change. The best dates come from Africa by the way of Tunis; they are as large as a finger and of an orange hue; their flesh is solid, vinous in taste, sweet, and somewhat viscous; they contain a nutritive principle helpful to horses, used on long journeys, and also useful in fattening cattle. The fruit is softened by boiling in water, and goat's milk is added. The Arabs in their pilgrimages across the desert make a species of bread from them, and use the pulp, extracted by pressure in earthenware colanders, for butter and sugar.

The fruit of the date tree contains mucilage, a gum similar to gum arabic, albumen, crystallizable sugar (cane sugar), parenchyma, pectose, citric and tartaric acids, coumarine, and water.

The dates of the Pharmacopœia in France are disgusting to eat, containing always the eggs and excreta of insects. They are not those which formerly enjoyed a great reputation as a remedy for phthisis, and as a nourishment to prolong life. Plutarch tells us that the master of Hippocrates lived a long time though touched with pulmonary phthisis, through the use of these dates and persistent exercise.

All parts of the date tree are used; the young branches recently cut furnish a milk which is both healthful and agreeable; this milk or sap when fermented affords an alcoholic drink named *lakhby*, or palm wine. Crushed dates with water also afford after fermentation the same decoction. Frequently the bark and fibrous portions of the young sprouts are removed to obtain the white substance within, which is eaten; the young leaves and the male flowers are also eaten when seasoned with citron juice, or arranged as a palm salad it forms a palatable dish. The Chinese use the date nuts in their writing and printing inks, and also as a dentifrice. The dried leaves are also used to make carpets and various other objects even in construction.

As the use of spirituous drinks is strongly prohibited by the Mohammedan religion, the date wine passes among the devout under the name of a remedy to rectify the crudities of the stomach. Formerly, to assist in curing certain maladies, the rich added to this liquor certain aromatic principles, and the poorer classes Persian absinthe. The nectar of dates that the sovereigns of the Congo drank a century ago, was the alcoholic product of fermented dates.—*Journal d'Hygiene.*

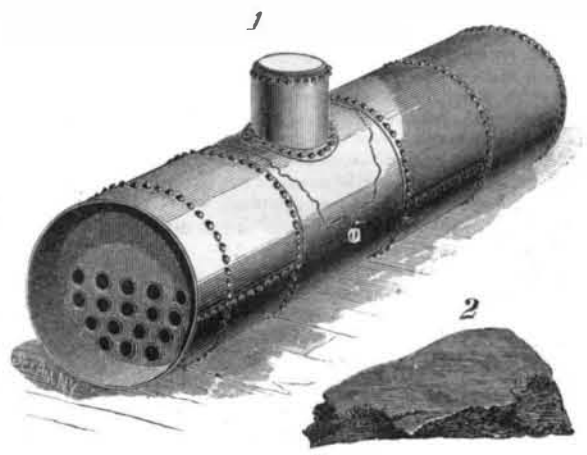
PROF. PALMIERI announces the existence in the lava of Vesuvius of a substance giving the spectrum line of "helium," an element hitherto recognized only in the sun.

Correspondence.

Boiler Explosion at Minneapolis.

To the Editor of the Scientific American:

The boiler in the machine shop of H. E. Penney, No. 315 Third Avenue, So. Minneapolis, Minnesota, exploded at fifteen minutes before 12 M., June 20. No one was hurt except one boy about seventeen years of age, who was at work at the pump near the rear end of the boiler. He was buried in the debris, but was got out within a few minutes somewhat bruised and burned. The rear end of the building, which was of brick, was demolished and most of the debris fell in on to boiler and engine. The boiler lay parallel with engine, and when the explosion occurred it left its bed and went sideways, apparently turning over once, and stopped directly on top of engine, breaking the fly wheel and other parts of engine. The boiler was a common tubular boiler about 30 inches diameter and 10 feet long, and contained 17 3-inch tubes. The second sheet from front tore across about the center of one side of boiler and then tore nearly around the boiler, as shown by sketch, which is intended to represent the boiler as it would appear if the ruptured sheet was bent back into place. The initial point of rupture was evidently at *a*, and the sheet containing dome went around the boiler until it was nearly torn from the boiler, leaving about one foot of the sheet not broken. The owner, Mr. H. E. Penney, says he had gone into the engine room and looked at the steam gauge, which indicated 60 pounds steam pressure, and had turned to go out when the explosion occurred, blowing him out of engine room into machine shop. The boiler is four years old, and made by Messrs. Glenn & Lusk of this city from one-quarter inch boiler plate, purported to be of 60,000 pounds tensile strength. I send herewith a piece from the side of the ruptured sheet, that you may examine for yourselves.



E. O. MCGLAUFLIN.

To the Editor of the Scientific American:

I notice in the SCIENTIFIC AMERICAN, June 2, 1883, an inquiry by C. D. & Co. as to the safe velocity at which a grindstone may be run, without danger of rupture from centrifugal force. Thinking it may be interesting to divers readers of the SCIENTIFIC AMERICAN, I send the following simple formula for calculating the strain per square inch resulting from centrifugal force in a cylinder, or cylindrical wheel, revolving upon its axis. Also, the velocity required to produce a given strain per square inch.

Making V = peripheral velocity in feet per second,
G = specific gravity of material,
C = the constant number $222\frac{836}{1000}$,
and S = strain per square inch, tending to part the cylinder through any section made by a plane coinciding with the axis,

Then $S = \frac{V^2 G}{C}$, whence $V = \sqrt{\frac{C\,S}{G}}$ = peripheral velocity producing a given strain equal to S upon each square inch of section, as above. Or, to state the same verbally:

The strain per square inch equals the specific gravity of material multiplied by the square of the peripheral velocity, and divided by $222\frac{836}{1000}$. And the peripheral velocity required to produce a given strain to the square inch of section equals the square root of the quotient of $222\frac{836}{1000}$ times the given strain divided by the specific gravity of material.

Hence, knowing the cohesive strength of the material, and the specific gravity, the speed may be limited to any required margin of safety.

S. WHIPPLE.

Albany, June 6, 1883.

A New Market in New York.

The new Washington Market building, New York city, will cost $250,000 and cover an area of 54,000 square feet. It will be built of iron and glass, one story in height, having frontages of 186 feet on West Street, 235 on Fulton Street, 255 on Vesey Street, and 175 on Washington Street. The roof will be of glass with a large dome in the center. The general height from floor to roof, except under the dome, will be 24 feet, but the standholders will not be allowed to run up their partitions more than 18 feet, thus insuring light from the roof over the entire building and a good circulation of air.