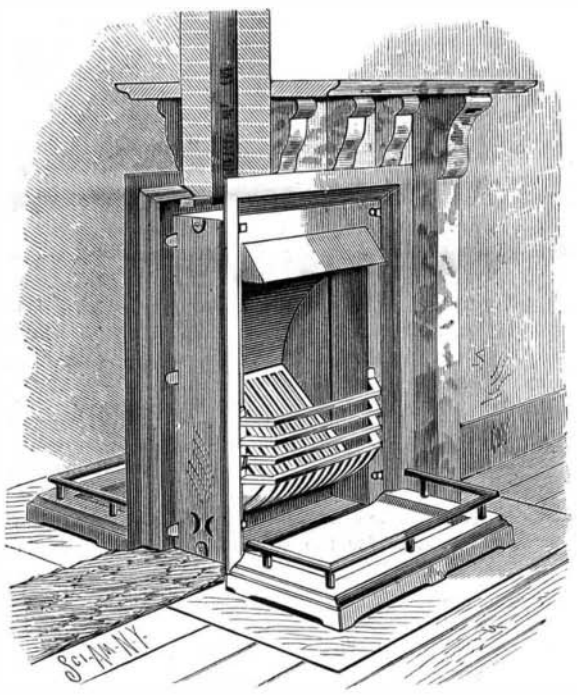
Cochin China Grapes in California.

A great number of experiments are being made in California with the seed of the Cochin China grape vine. Seed has been distributed among 800 persons in various parts of the State, and no pains will be spared to acclimate this vine on the Pacific Coast. In its native state it has been found in altitudes varying from 100 to 3,000 feet above the sea level, producing everywhere an enormous crop of fruit. With proper care, authorities in grape culture believe that the Cochin China variety can be grown in all the wine regions in California, and on the Pacific Coast. A vine similar to this, but more vigorous and productive, was lately



IMPROVED GRATE.

discovered on the coast of Guinea by Senor Arpore, chief of a scientific mission sent to that country by the Portuguese Government. The plant was found to be about 4 feet high, with a crop of grapes varying from 90 pounds to 100 pounds on each vine. The fruit was delicious, and the wine made from it was found to be very good, rich in aroma, in color, and in alcohol. A report is being prepared on the subject for the Portuguese Government. The Soudan and the Guinea annual tuberous vines are of the same class as the Cochin China, but the first is a dwarf, and the second little better, as compared with the last named. In Cochin it grows in some forests as high as 100 feet, climbing up and around lofty trees, or stretching itself on the soil, and in some places the vine becomes a wonderful mass of large clusters of luscious grapes from top to bottom.

Spontaneous Ignition of Coal.

The causes of the spontaneous ignition of coal have been much inquired into, and several theories propounded thereon. Durand, among others, has maintained that the presence of pyrites in the coal is a principal cause of this trouble; while, on the other hand, the same result has been shown to have been caused even more frequently by the oxidation of the coal itself. This view of the case is confirmed by Fayol's experiments, recorded in *Dingler's Polytech. Journal*. The absorption of oxygen by coal is affected by the temperature, and the fact of the coal being more or less finely divided. Lignite in the state of fine dust inflames at 150°, and gas carbon at 200°, coke at 250°, and anthracite at 300° and upward. On heating a mixture of finely powdered coal and pyrites to 200° for a period of four days, the coal took up 6 per cent of oxygen, while the pyrites absorbed only 3·5 per cent. From this it appears proved that coal absorbs oxygen much more energetically than pyrites. This is also confirmed by another experiment, in which about 900 grammes of powdered coal and 3,350 grammes of powdered pyrites were placed in tin cans, and dried in a hot chamber. Up to 135° both materials behaved similarly; but afterward the temperature of the pyrites remained almost stationary, while that of the coal rose very quickly, until, after a few hours, ignition took place. Two other samples of coal and pyrites were then put into a chamber heated to 200°, when the temperature of the coal quickly increased. In forty minutes the coal took fire, while the pyrites had in the same time only risen to 150°. Thus the ignition of the coal was not at all hastened by the admixture of pyrites.

THERE have been a great number of earthquakes in Great Britain from time to time. The last of note was that of 1816. It extended over a vast area of country, and in some localities its effects were scarcely felt. The lakes of Cumberland and Durham and those of Scotland were visibly agitated.

IMPROVEMENT IN HEATING GRATES.

In fire grates, as commonly constructed, only a small proportion of the fuel burned is effective in heating the apartments in which they are located. Much of the heat goes up the flue, and a large proportion of it is conducted away by the wall or chimney in which the grate is placed.

Captain J. H. Burnam, of Fayetteville, Tenn., has devised and patented a plan for utilizing the heat that was formerly wasted at the back of the grate, and we are informed that he has been successful in heating two rooms with the fuel usually consumed in an ordinary grate for heating one. This important result is secured by placing in the wall a square casing connecting two adjoining rooms and communicating at the top with the chimney. In this casing is placed a curved fire-back, whose concave side receives the inclined grate upon which the fire is built. The convex side faces the adjoining room and forms an efficient radiating surface. A register is placed in front of this surface to regulate the temperature of the room by screening the plate more or less, and reducing the circulation of air across the plate.

The fire-back is reversible, and the grate may be placed in either room at pleasure. There are at the sides of the iron casing air or ash flues. The chimney required for this grate is very simple and inexpensive, as compared with that of an ordinary one, and the improved article, with fire-back and fittings, is less expensive than the grates of the usual form that would be required to do the same amount of heating.

According to the figures of the inventor, one-half of the fuel, and about half of the expense of putting in the grate and building the chimney, is saved by this improvement. The mantel, hearth, and grate may be of any desired character.

Fig. 1 is a vertical transverse section of the grate, and Fig. 2 is a perspective view with parts broken away to show the construction.

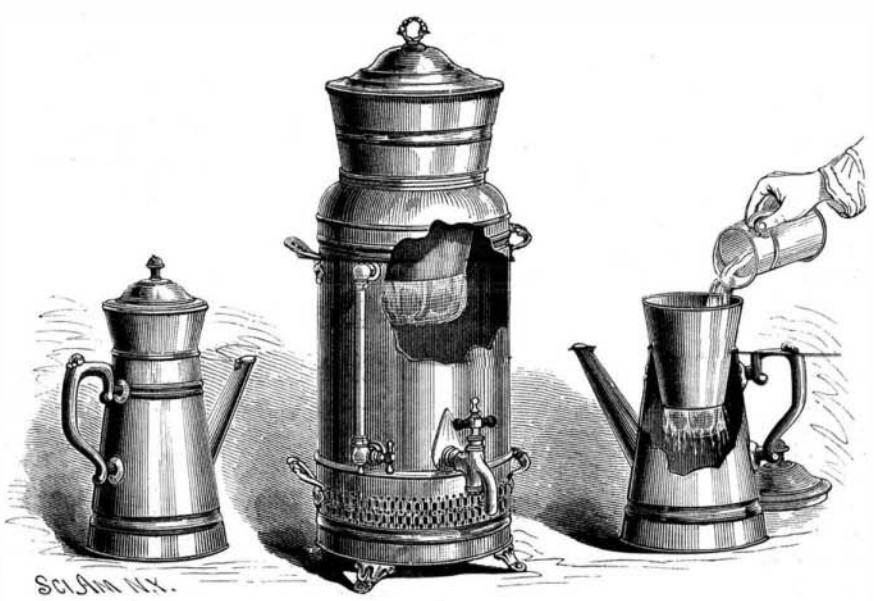
IMPROVED TEXTILE FILTER.

Numerous coffee pots and filters have been used for extracting the entire strength and aroma from coffee, but the results obtained have not been perfect, for if the coffee is ground very fine the decoction is muddy, and if the ground coffee is coarse, the hot water cannot extract all the strength and aroma from the coffee. The textile filter manufactured by the New York Textile Filter Company avoids the above difficulties, and filters coffee, as well as other liquids, to perfection.

This improved filter is shown in the annexed cut, the middle figure showing it used in a coffee urn, the right hand figure showing the manner of filtering the coffee, and the left hand figure showing the filter and coffee pot combined. The filter consists of two cones, the smaller resting inside the larger, and firmly holding the textile fabric. The greater the pressure, the more securely the fabric is held.

The coffee used must be pulverized or ground very fine, and is placed within the filter; the filter is then placed within the pot or urn, and boiling water is poured into the filter. As the filtering fabric or muslin is at the bottom of the cone, the entire volume of water above the filtering fabric exerts a pressure and forces the liquid through the sides and bottom of the inner cone, the apertures in the inner cone preventing the clogging of the filter. As the coffee is not boiled, it will not have the bitter taste of the decoctions usually called coffee. The filter is made in three sizes, which are adapted to fit any tea or coffee pot, and can readily be removed and taken apart for thorough cleaning. It can also be used for filtering water, drugs, liquor, jellies, milk, and lemonade. It is made of planished metal, glass, and porcelain. Made in glass, it is very valuable for filtering drugs and chemicals. It is patented in this country, also in England, Canada, France, Germany, and Belgium.

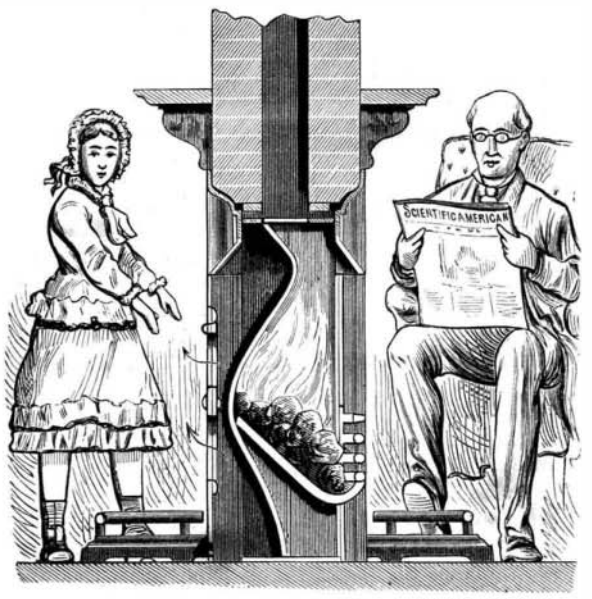
It is manufactured and sold by the New York Textile Filter Company, 46 Murray St., New York city.



TEXTILE FILTER, COFFEE POT, AND URN.

A Submarine Balloon.

During the forthcoming International Exhibition at Nice the submarine observatory of M. Toselli will be in use in something the same way as the captive balloon at the Paris Exhibition of 1878. It is made of steel and bronze to enable it to resist the pressure of water at a depth of 120 meters, nearly 160 pounds to the square inch. The vessel is divided into three compartments, the upper for the commander to enable him to direct the observatory, and give explanations to the passengers, who, to the number of eight, occupy the middle compartment. They have under their feet a glass plate, enabling them to see the bottom, with its corals, fishes, grass, etc. The third compartment contains the buoyant



IMPROVED GRATE.

chamber, and can be regulated at will. As the sea is dark at the depth of 70 meters, the observatory is to be lighted by electricity, and a telephone communicates with the surface.

Discovery of a Telescopic Comet.

Mr. William R. Brooks, of the Red House Observatory, Phelps, N. Y., says that on September 1, 1883, he discovered a telescopic comet in the constellation Draco, right ascension 16 h. 35 m., and north declination, 64° 5′. The comet is faint, without tail, and has a small, sparkling nucleus.

"It has been my fortune," says Mr. Brooks, "to discover the first and only two comets, thus far, of 1883. This last one was discovered with the aid of a nine inch reflector, which, like all my astronomical instruments, is of my own manufacture."

Photo Zinc Lithographic Plates.

In the office of the French Minister of Public Works, charts and plans are prepared by a process of photo-zincography. The *Bulletin de la Societe d'Encouragement* thus describes it: A plate of commercial zinc is chosen which is free from defects. In order to cleanse it thoroughly it is rubbed with a stiff hair brush which is dipped into a mixture of one third sulphuric acid and two-thirds water. After this cleansing, which removes every trace of oxidation and grease, the plate becomes very brilliant, and it is rubbed for some minutes with a cork dipped in powdered pumice stone. It is then washed and plunged, for ten or fifteen minutes, into a bath acidulated with 3 per cent of nitric acid. The plate then has a dull look and shows a slight roughness under the microscope. After having carefully dried it, it is covered by a preparation composed of 10 liters of water and 500 grammes of crushed nutgalls. After boiling this it is reduced about one-third, it is cooled and filtered through linen; then are added 100 grammes of common nitric acid and 6 grammes of pure chlorhydric acid. After the preparation has been left in contact with the plate for some time it is washed and dried, and then coated with bitumen in the ordinary manner, and exposed to the light under the drawing which is to be copied. When the exposure is over, the plate is warmed slightly and developed with the addition of a liquid containing 5 per cent of acetic acid. To facilitate the inking, it is well to apply to the lines some oil, which destroys their brilliancy and turns them gray. Then, after a careful drying, the bitumen is dissolved by benzine, and the plate is again dried. It can then be delivered to the printer, who submits it, without any precautions, to the ordinary operations of lithography for inking and printing.

A WRITER in one of the medical journals says he has found the application of a strong solution of chromic acid, three or four times a day, by means of a camel's hair pencil, to be the best and easiest method for removing warts.