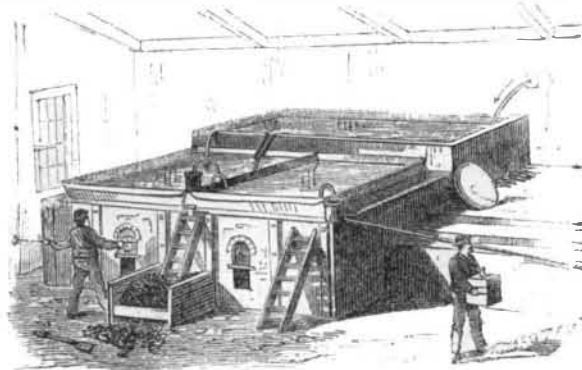


patched or renewed. When a break occurs, it is sometimes soldered with gold. To avoid the large outlay of capital for a platinum still, various suggestions have been made as to the use of other materials, and various forms of apparatus have been devised for the final concentration of sulphuric acid.



LEADEN CONCENTRATING PANE.

Although glass has been tried, and used in England, we know of no apparatus more ingenious and effective than the

PATENT GLASS CONCENTRATING RETORTS

shown in the large illustration (front page), and now in successful use at the Phoenix Chemical Works, South Brooklyn, N. Y. Here we have eight glass retorts, each holding about five gallons, and each set in a separate sand bath, in furnaces charged from the side. The acid from the leaden pans enters by a siphon, the upper retorts of each set or series, and flows out, after attaining a certain height, by a glass tube, into the next lower vessel. By the time the acid has reached the lower retort, it is concentrated up to strength, that is, 66° Baumé. It then flows out into a leaden pipe set in a trough of running water, where it is cooled to some extent, and whence it flows into shallow leaden pans to undergo a further reduction of temperature before it is packed for the trade. The goose neck of each retort is connected with a leaden pipe, seen in the illustration between the two series. This pipe joins a flue (seen on the left, rising from the lower end of the furnace) which conveys the mixed vapors of acid and water, evolved during the concentration, to a condensing chamber, also of lead, where the acid, which would be otherwise lost, is recovered.

Although of so fragile a nature, the inventor informs us that, with care and attention, it is not very often a retort breaks; he had not lost one during the last six months. When this does happen, however, means are provided in the shape of a channel, which runs under and communicates with each sand bath containing the retorts for the purpose of recovering all the acid possible and delivering it into a receptacle in front of the furnaces.

This apparatus of concentrating retorts is far cheaper than a platinum still. The glass retorts, with their furnaces and connections, capable of concentrating 100 carboys daily, will cost about \$2,000, while a platinum still, capable of doing the same work, will cost \$30,000.

We now follow the acid from the concentrating retorts to the cooling cisterns, where our illustration shows the workman

FILLING THE CARBOYS.

This is done by means of a leaden siphon, provided with a stop cock. Care is taken not to fill it quite full, otherwise the absorption of water from the air by the acid, in the



FILLING THE CARBOYS.

course of time, will cause an overflow. A carboy is a large blown glass bottle containing eight or ten gallons, packed in hay or straw and set in a square wooden box. The mouth is closed when full, to prevent spilling and access of air, as far as practicable, by a stopper of clay, which is covered with a common canvas rag, and the whole smeared outside with tar. This makes a primitive rough-looking package, and one extremely liable to accident and breakage; but the trade seems to be satisfied with it. An opportunity is here afforded for some ingenious inventor to make an improvement.

When once the glass is cracked or broken at the bottom, there is a sudden end of the carboy, as both straw and wood soon become converted into soft charcoal. These carboys are transported all over the country, and, when emptied, returned to the manufacturer, if not too distant, to be replenished.

The quantity of oil of vitriol annually manufactured in

Great Britain amounts to about 200,000 tons, that made in the South Lancashire district alone exceeding 3,000 tons per week.

We are indebted to Messrs. Gridley & Coffin, proprietors of the Phoenix Chemical Works, and to Mr. Saunders, the superintendent, for facilities afforded in making the illustrations connected with our article.

NORWAY AND SWEDEN.

An esteemed correspondent, now traveling in Northern Europe, remarks as follows:

"Never could more dissimilar nations be united under one government than Norway and Sweden. Norway clings with the most absurd tenacity to old things and old ways of doing them, while Sweden is ready to advance with the rest of the world. The difference appears strikingly on the line of railroad between Christiania and Stockholm. The road is about 400 miles long, of which, say, 100 are in Norway and 300 in Sweden. The time for express trains is about 20 hours. Of this, something like 8 hours is taken for the Norwegian 100 miles, leaving 12 hours—really, only 11 hours—for the Swedish 300 miles, or 12 miles against 25 miles per hour. But most of the travel in Norway is by the very old fashion of carriages and post horses, the principal roads—under government care—being in good order and the speed averaging, with push, six or seven miles per hour.

The American Consul in Christiania—which is the only live part of Norway—is trying hard to get our mowers and reapers into use there, though thus far with indifferent success. In Sweden, these things are being taken hold of with something like freedom. The Swedes are, evidently, a contriving and mechanical people, and in such things very much in advance of their neighbors. They are just the kind of people to be at home in America, and the very best kind of people America could have. In both countries, as well as in Great Britain, I heard the loudest kind of lamentation over the great emigration to America. Lack of laborers causes strikes and high prices, they say, and reduces the means of the old countries and the values at the same time. Land, generally, seems to have touched its highest point everywhere on this side the ocean, and to be falling with no little rapidity, and with an ever diminishing number of purchasers. Of course, I speak generally and not particularly. What shall we do about it? seems to be an absorbing question, in each of the countries through which I have passed. The story of success in America flows back from every pen; and those who remain, having friends who have gone before, are in nearly every case anxious only to get away themselves."

Origin of Plagues.

Dr. Tholozan, physician in chief to the Shah of Persia recently read a paper before the French Academy of Sciences on the origin of pestilence. It has been generally believed, he said, that the plague or eruptive fever was exclusively engendered in low, warm, and marshy regions, especially in the north of Africa and in Asia Minor. This opinion is, however, without foundation, and a large number of facts as well as the evidence of past inflictions, prove that the disease may originate in any latitude, under all climates and in all countries, however elevated. It is not a consequence of climate or meteorologic influence, nor even the necessary concomitant of unhygienic causes, however energetic. Famine, for instance, breeds typhus fever rather than the plague. This exclusion of all physical origin leads to the conviction that the malady is due to some animal ferment; the pest, in short, is an organic fermentation.

M. Tholozan added that he considered the deadly forms of pestilence so common in Kurdistan to be principally due to the intimate contact of the inhabitants with their sheep in unhealthy and badly aired cabins.

Shocking Accident.

J. E. E., of Pa., says that Miss Craft, a young lady from Beaver Falls, Pa., while in a flouring mill, was standing near two upright shafts that were revolving at the rate of fifty revolutions per minute, one of the shafts being covered with sticky corroded oil. Her dress, being of light material, touched and adhered to it; and instantly winding around the shaft, she was drawn between the two (they are only a few inches apart) which caught her flowing hair, then tearing the entire scalp from her head, to the eyebrows. One leg was badly fractured and she was much lacerated and bruised. She lies in a critical condition and her physicians have no hopes of her recovery.

Upright running shafts are always dangerous, and owners should have them encased with wood boxing

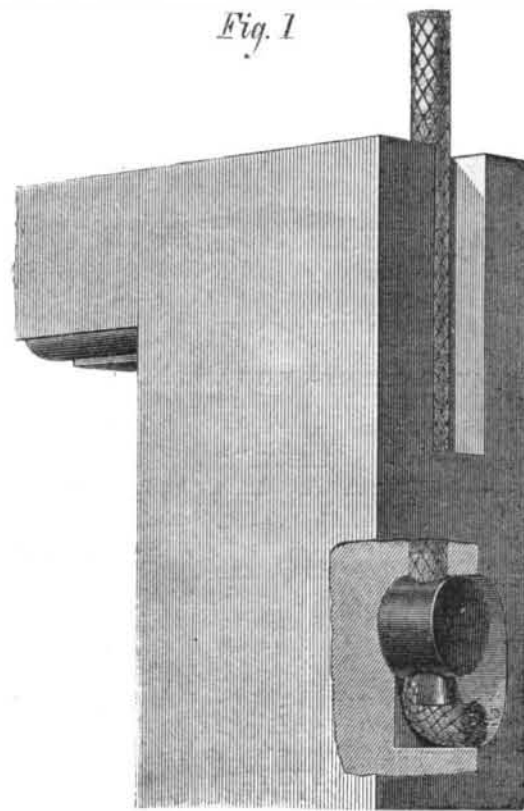
New Photo-Process.

A recent improvement, announced by Mr. Burgess, a photographic artist of Peckham, England, consists in sensitizing gelatin by means of bromide of silver. The mixture is applied warm to the glass plate, and the picture may be taken with the plate either wet or dry. The time of exposure is the same as for the ordinary wet collodion plates. The alkaline-pyro developer is used, the picture making its appearance rapidly, with any required degree of intensity. The new process promises to compete sharply with the ordinary collodion process.

THE reason why common salt sometimes becomes moist when exposed to the atmosphere is because it is not pure Chloride of calcium and chloride of magnesium are impurities generally present in salt, and they absorb moisture from the air.

HARRIS & HEWITT'S PATENT SASH CORD FASTENER.

The object of the invention represented in the accompanying engravings is to dispense with the knot commonly used to fasten window cords to sashes. Any one, who has ever attempted to re-adjust the old fashioned though simple arrangement, will not fail to appreciate the utility of the



new device. An old knot is very commonly drawn up into the hole through which the cord passes, and requires no small exercise of time and patience to force it out. This only begins the trouble, for the rope has become hard and jammed, and persistently refuses to untie. After breaking off his finger nails and working himself into an uncomfortable perspiration, the operator, probably with a few forcible interjections, settles the difficulty by hacking the obdurate knot off with his knife. Then he pokes the rope carefully through the hole again, triumphantly ties a new knot, and pulls down the sash with a sigh of relief. The window descends nicely until within two inches of the bottom, and declines to move any further. He pulls, and pitches his whole weight on it, and gets mad, and screams short texts not taught in Sunday schools, and finally tries to push it down with his foot, and in doing so breaks a pane of glass. Then he retires for a short distance, and sits down on a toolbox and glares. Eventually he discovers that the cord, by cutting off the knot, has become too short, and the weight is jammed against the pulley: and consequently, after briefly communing with the weight and the cord and everything in any wise connected with the window, he puts on his coat, and goes down the street for a new rope, which, after considerable tribulation, he manages to adjust.

All this trouble is obviated by the little fixture herewith illustrated, the cost of which is only nominal, being, at retail, less than six cents to a window. It consists of a short cylindrical casting with a taper hole through it, through which the cord is passed after being threaded through the opening in the edge of the sash in the usual manner. There is also a serrated wedge, which is pressed into the hole in the fixture beside the cord, as shown in the illustration, fastening it very securely. This wedge is so proportioned that it is impossible to draw it through the casting, and no matter how hard it may be dragged up, a slight pull at the short

Fig. 2

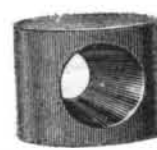


Fig. 3



end of the cord will instantly release it for renewal or re-adjustment. No special preparation of the sash, different from that ordinarily made for the knotted cord, is necessary.

The expense of this fixture, it is claimed, in first hanging, is more than saved in time and cord. It has been tested or examined, and is approved, by the leading builders and architects of Newark, N. J.

Patented July 22, 1873, by Horace Harris and Frederick Hewitt, 788 Broad street, Newark, N. J., from whom further particulars may be obtained.

APPROACHING EXHIBITION AT MONTREAL.—An agricultural and industrial exhibition will be held at Montreal on September 16, 17, 18, and 19, 1873. In all departments, the competition is open to exhibitors from any part of the world. The whole fields of agriculture and manufactures, commercial and domestic, are covered by the long list of premiums. Mr. Georges Leclère is the secretary, who will furnish full particulars if addressed at Montreal, P. Q.