

Fireproof Paint.

Various substances have often been proposed as fireproof coatings for the protection of woods employed for building purposes, but most of them have been abandoned as being either too costly or not sufficiently durable. The following process, invented by Messrs. Vildé and Schambeck, is described in *La Papeterie*. The paint consists of 20 parts of finely pulverized glass, 20 parts of finely pulverized porcelain, 20 parts of any sort of stone in powder, 10 parts of calcined lime, and 30 parts of water-glass (silicate of soda), such as usually found in commerce. The solid elements having been powdered as finely as possible and sifted, are moistened, and then intimately mixed with the water-glass. This yields a mass of sirupy consistence that may be employed for painting, either alone or mixed with color. The addition of the lime gives a certain unctuousity to the mass for whitewashing, and its combination with the silicic acid of the soluble glass serves to bind the other materials together. The proportion of the different elements above mentioned may be changed save that of the water-glass, which must remain constant. These elements may even be replaced one by another; but it is always well to preserve the lime. Instead of the silicate of soda (soluble glass of soda), soluble glass of potash might be used; but the former is less expensive. The coating is applied with a brush, as other paints are, as uniformly as possible over the surface to be protected. The first coat hardens immediately, and a second one may be applied six hours or more afterward. Two coats are sufficient. This paint may likewise be employed as a preservative against rust, and used as a coating for iron bridges, etc.

LOG SETTING APPARATUS FOR SAWMILLS.

The engraving shows an apparatus by which the sawyer is enabled to gear the log shifting devices of the carriage with a shaft located alongside of the carriage, so as to shift the carriage forward or backward at will.

The carriage ways or tracks, head block, sliding knees, racks, the adjusting shaft, and pinions are of the ordinary construction.

To turn the adjusting shaft and pinions by power at the will of the sawyer, for setting the log up to the saw from time to time, and for shifting the knees back when a new log is to be put on, there is arranged a long shaft at the side of the carriage, at the back. This shaft is revolved continuously by a belt from any suitable driving pulley. On this shaft there is a double pulley arranged so as to slide along it as the carriage goes, the pulley having a feather running in the groove of the shaft, so that it may revolve with the shaft so as to drive the friction pulleys journaled in the swinging frames above and below a pulley on the log adjusting shaft. The upper pulley is driven by a straight belt, the lower one by a crossed belt for reversing the motion.

The pivoted frames carrying the friction wheels are suspended from the hand lever at the top of the first knee rods, so that by shifting the lever in one direction one of the friction wheels will be made to drive a wheel on the adjusting shaft in one direction, and by shifting it in the other direction the other wheel will drive it the other way, while in the middle position both wheels will be disconnected and the wheel on the log adjusting shaft will be inoperative.

A scale is so located with reference to a pointer on the first knee as to gauge the movements of the knees.

With apparatus of this kind the setting of the logs is greatly simplified, and at the same time it may be done accurately and quickly.

This invention has been patented by Mr. Walter P. Schofield, of Cedar Keys, Fla. Further information may be obtained by addressing Messrs. Schofield & Bailey, at the same place.

Manufacture of Aluminum.

The English patent of James Morris is as follows: Powdered charcoal and lampblack are mixed with a strong solution of chloride of aluminum and dried by heat to a stiff mass. When the heat has expelled the HCl, they are formed into pellets. These pellets, consisting of 5 of carbon to 4 by weight of alumina, with a little water, are placed in a retort and heated, while for fifty hours a current of carbonic acid is passed through. Carbonic oxide is formed, and while in the nascent condition takes oxygen from the alumina till the carbon is mostly consumed and a sponge of aluminum is left. This is then melted in a crucible with cryolite.

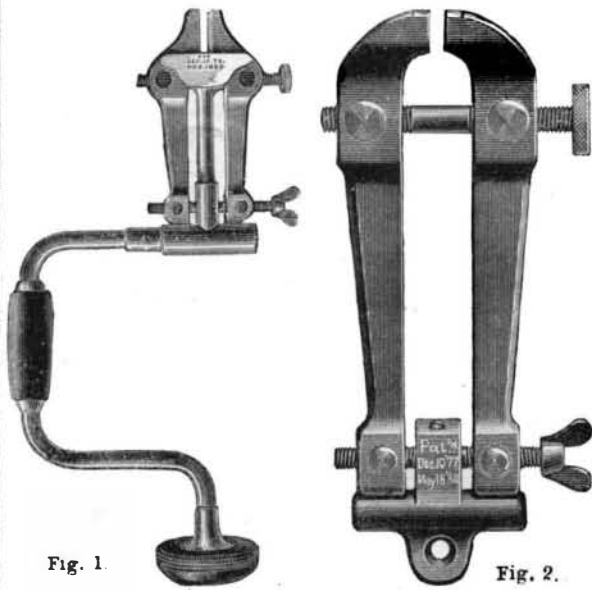
The Anthracite Product of Pennsylvania.

The past year's output of the anthracite coal mines of Pennsylvania was the largest on record. It was, in round numbers, 29,500,000 tons, or nearly 1,000,000 tons more than in 1881.

IMPROVED VISE.

We give engravings of a vise which is novel both in form and in the principle upon which it operates. Only two styles are shown, one being a hand vise, the other a brace wrench. In addition to these, vises on the same general principle are made in larger sizes for bench work, for smiths, and for all other purposes where a substantial and reliable vise is required. It not only acts as a parallel vise, but it has greater gripping power than vises of the usual form, and is much more powerful than the ordinary parallel vise.

All of the parts are of steel, drop forged, and finished by the most approved machinery, so that the pieces of any particular style of vise are interchangeable, admitting of renewing broken or worn parts if required.

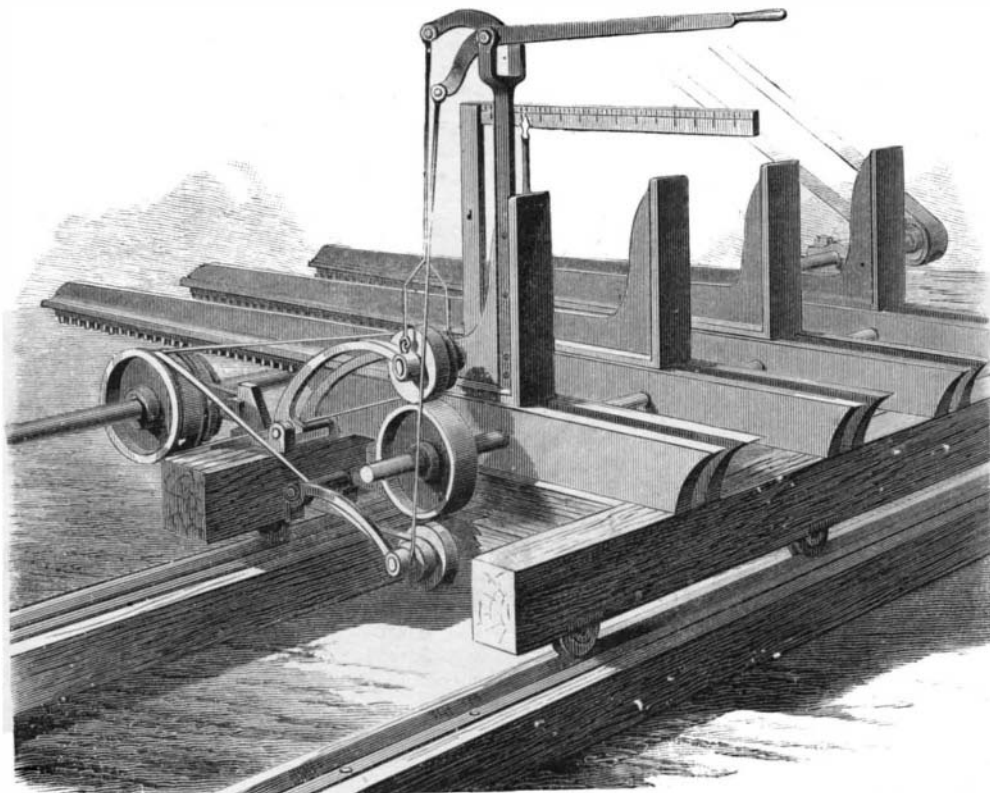


COMPOUND POWER VISE.

Being made wholly of steel, these vises are not only lighter but stronger than iron vises.

The jaws are provided with two screws, each right-handed on one end and left-handed on the other, so that by turning the screws in one direction the jaws will be approached toward each other; and by turning them in the other direction the jaws will be separated. The nuts in which these screws work are cylindrical, and are capable of turning in their bearings in the jaws, so that the screws always have a direct bearing. The movement of the jaws is very quick, and by turning both screws alike, the jaws are kept parallel with each other. When the jaws are nearly approached to the object to be grasped, or in contact with it, the tightening or principal pressure is secured by turning the screw farthest from the jaws.

In its application to the brace, as shown in Fig. 1, the



SCHOFIELD'S LOG SETTING APPARATUS FOR SAW MILLS.

vise may be used to turn nuts and bolts, also drills, bits, and other tools.

The vise represented in Fig. 2 is designed to be used as an ordinary hand vise, or as a vise for line men in running telegraph, telephone, and electric light wires. Provision is made for a ring to receive a strap, and the small ends of the jaws slide in ways in the crosspiece, so that no strain is put upon the screw.

Further information in regard to this useful invention may be obtained by addressing Messrs. Cook & McLane, 81 Centre Street, New York City.

Surgical Instruction for Engineers.

It is pretty generally recognized among surgeons that the successful practitioner of that art has need of not a little mechanical ability. Indeed, many if not most surgeons of eminence have shown a genius for mechanics of the finer sort, and have owed to their mechanical skill and dexterity no small portion of their professional success.

On the other hand, it is beginning to be understood that a limited knowledge of operative surgery, certainly enough of the art to enable a man to tie an artery, stanch a flow of blood, or bind up the wounds of an injured workman or traveler, is highly desirable, if not vitally necessary, to mechanics and engineers. This is especially true of the foremen of machine shops, engine drivers, and civil and mining engineers. In many manufacturing operations and in all works of constructive and mining engineering, accidents are always liable to happen; and not unfrequently the needed surgeon is miles away. In any case, the advantage of having close at hand some one familiar with the first treatment of serious hurts, who can do what is needful to be done in such emergencies to keep the patient's life from wasting before the regular surgeon's help can be obtained, is beyond question.

Hitherto, so far as we know, provision for this important line of instruction for young engineers and foremen in constructive works has never been made by our technical institutions. The trustees of the University of Pennsylvania, however, have now taken the first step in a movement in this direction, and have engaged a lecturer on operative surgery to give a course of lectures on surgery to the senior scientific classes of the collegiate department of the University, especially the mining and engineering sections. The innovation is a good one, and it is to be hoped that the results will be so encouraging that the lectures will be not only continued, but imitated in all high grade technical schools.

Progress in Florida Drainage and Exploration.

A press dispatch states that the dredge of the Okeechobee Drainage Company, working up the Caloosabatchee River, entered Lake Okeechobee December 25, thus completing a navigable channel from the Gulf of Mexico to the heart of the Everglades. The canal is also expected to be an important factor in the draining of large areas of rich sugar land about Lake Okeechobee.

Though Florida was the first settled of all the Atlantic States, the great swamp country of the Everglades remains one of the least known regions of the globe. The first party of white men known to have crossed that part of the State completed their venturesome trip December 14. It was an exploring party sent out by the *New Orleans Times-Democrat*, with two boats. Their route was from Kissimmee City, across Lakes Tohopekaliga, Cypress, Hachewaha, and Kissimmee; down the Kissimmee River to Lake Okeechobee (exploring Lake Okeechobee on the eastern and western shores); across the lake to the entrance to the canal of the Atlantic, Gulf Coast, and Okeechobee Land Company, at which point their boats were hauled to the dredge boat in the canal, down the canal to Lake Hickpochee; through Lakes Hickpochee, Lettuce, and Flirt to the Caloosabatchee River, and down the river to Fort Myers, a distance of about 500 miles. The explorers say that the garden spot of Florida is there in the unsettled interior.

American Ochre.

In a communication to the Tariff Commission, Mr. Junius Gridley, Secretary Bermuda Ochre Co., of this city, states that until the year 1871 no ochres were found in the United States that could successfully compete with the ochres imported from France, in point of color and other characteristics. Common ochres, however, were abundant and largely mined, especially in Vermont and Pennsylvania, which are extensively used by oil-cloth manufacturers for a filler in the body of the cloth where the color or tint is of no account.

In 1872, a deposit of ochre equal in quality to the French product was discovered on the Appomattox River, at Bermuda, Va. From this deposit are now taken 1,000 tons a year, or about one-third the fine ochres used in the United States. The Virginia deposit contains about 10 per cent of sand or grit, which has to be washed out before the ochre can be ground and bolted. The French (Rochelle) ochres are so pure that they may be mixed and ground without washing. They are shipped as ballast freight for much less than the cost of transporting the Virginia ochre from City Point to New York by steamer. Since the Virginia deposit was opened the price of Rochelle ochre has fallen from 34 cents to 1 1/4 cents a pound, the effect, it is claimed, of the competition of the home product.