

PLATE SHEARING MACHINERY.

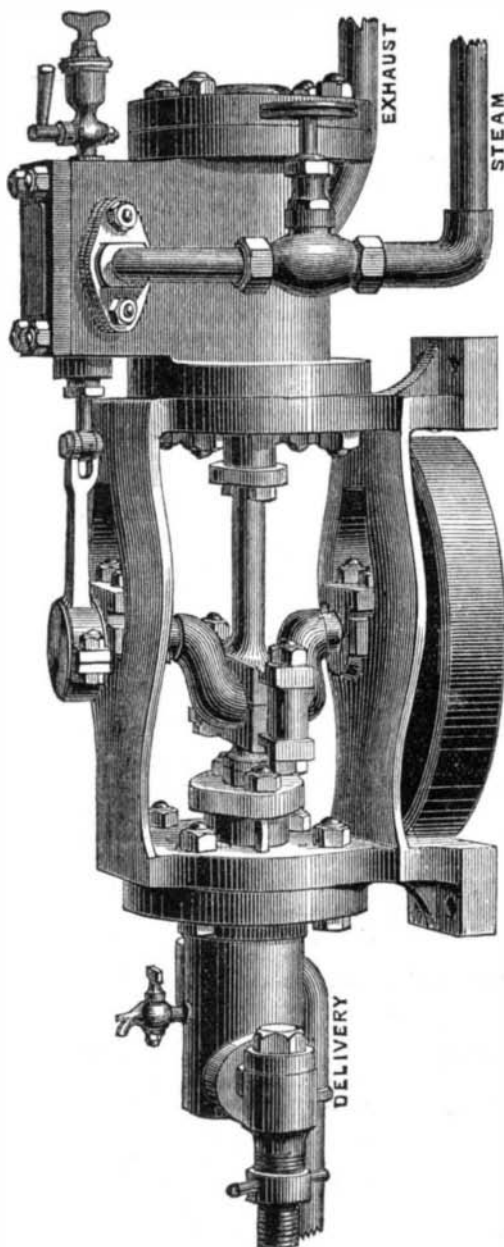
A plate-shearing machine, with revolving cutters, of which we give an engraving herewith, was recently exhibited at Manchester, England. It is provided with an adjustable grooved table and sliding bar, with a stud on the latter, for shearing plates to different radii. A special feature in the machine is that the top cutter shaft is mounted in eccentric bushes, so that by turning these bushes it can be brought nearer the bottom shaft, so as to take up the wear of the cutters. The eccentric bushes are graduated on the edges, so that the two may be turned equally, and the two shafts be thus maintained parallel. The machine will shear plates up to three sixteenths of an inch thick, and it is altogether of a neat and good design.

Natural Gas Fuel.

A few weeks ago a line of pipe was laid from wells in Butler county, Pa., to the mills of Graff, Bennett & Co. on the West Pennsylvania Railroad, in Sharpsburg and Aetna, a distance of eighteen miles. It was not known before the connections were made whether there would be a sufficient pressure of gas to make the scheme a practicable one. At a fixed time, however, the connections were made at the well; and the air having been exhausted from the eighteen miles of pipe, the gas rushed through, and in twenty minutes was pouring in great quantities out of the pipe at the furnaces [The velocity maintained is doubtless a mistake.—*EDS. SCI. AM.*] When the gas was lighted the flames flared up 40 feet high, with a volume sufficient to supply double the quantity of heat required. It is expected that in these two furnaces a saving in fuel of from \$40,000 to \$50,000 a year will be made. In Rogers & Burchfield's rolling mill, the gas has been used for more than a year, and the saving in fuel is estimated at \$60,000 per annum, although only 125 men are employed there. The gas has been flowing with apparently undiminished force for ten or twelve years, and there is no known limit to the supply. Some enthusiasts in Pittsburgh prophecy that within a few years the majority of the furnaces and mills in that great manufacturing city, as well as the parlor grates and kitchen cooking stoves and ranges, will be heated by this new fuel.

DONKEY PUMP.

Subjoined we give a perspective view of a form of donkey



pump which is now being made by Messrs. Hayward, Tyler & Co., and which was exhibited by them at the recent show

of the Royal Agricultural Society at Taunton, England. As will be seen from the view given, the pump is adapted for being bolted up against a wall or boiler, and it is of a neat and compact form, while the pump valves are very readily accessible. The arrangement is so clearly shown by our engraving that no further description will be necessary.

Hygiene for Smokers.

The following are Dr. Berthand's precepts and advice to smokers: Never smoke more than three or four pipes or

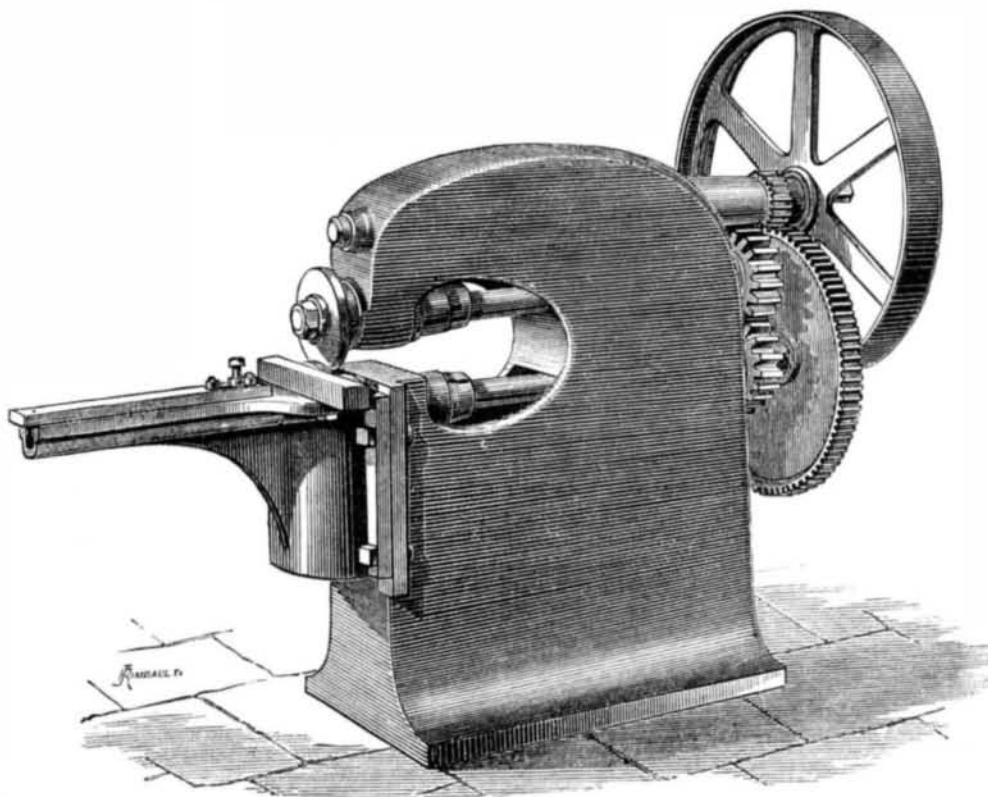


PLATE SHEARING MACHINE WITH REVOLVING CUTTERS.

cigars a day, and, if it is possible, limit yourself to two. It is unwholesome to smoke on an empty stomach or immediately before or after a meal. Whatever be the mode of smoking, direct contact of the tobacco with the *mucos buccalis* (mucous lining of the cheeks) and the teeth must be avoided. Cigars should be smoked in an amber, ivory, or enameled porcelain mouthpiece. To smoke, by relighting the portions of cigars that have been extinguished, together with the system of blackened and juicy pipes, constitute the surest way of being affected by nicotine. Every smoker would do well, if he could, to rinse his mouth after smoking. A *fortiori* is the same precaution applicable to chewers. For the same reason it would be well to subject pipes and bowls, in which tobacco has been burnt, to frequent washings either with ether or with water mixed with alcohol or vinegar. It is difficult to choose between the different ways of smoking. I give preference to the cigarette, by reason of its slight quantitative importance and the paper which interferes with the contact of its contents with the buccal mucous membrane. But to realize all the *desiderata*, it would be necessary to have the *papelito* made of flax thread and to abstain from the practice which has become the *ne plus ultra* method of its kind, retaining the aspiration at the back of the mouth, so as to pour it out of the nostrils afterward. The premature habit of smoking is certainly hurtful to childhood and during the adolescent period of organic evolution. The economy cannot but suffer, at this period, from the narcotic influence, be it never so slight, and from the salivation which is inseparable from this act. All persons cannot smoke with impunity. There are pathological counter-indications or idiosyncrasies to this habit that it would be imprudent and culpable to infringe. Diseases of the lungs, of the heart, chronic affections of the mouth, nose, eyes, throat, and stomach, are the results of the principal incompatibilities. The airing of apartments where smoking has taken place should be well attended to. To sleep in rooms where tobacco smoke exists, slowly constitutes a grave infraction on the elementary laws of hygiene.—*Tribune Médicale*.

Chloride of Silver Battery of 3,240 Elements.

Messrs. Warren de la Rue and H. W. Müller have constructed a battery composed on the one part of 1,080 elements, each consisting of a tube of glass 6 inches in length, and of 2,160 elements formed of glass tubes of 5 inches in length only. All the tubes are 0.75 inch in diameter, and are closed with stoppers of vulcanized india-rubber, perforated with a hole near the edge to permit the introduction of a rod of amalgamated zinc, 0.2 inch in diameter and 4 inches in length for the first 1,080 elements, and 3 inches for the remainder. At the bottom of each tube, powdered chloride of silver is placed, 220 grains in weight, compressed strongly with wooden rods, a flattened silver wire having been first introduced to the bottom of the tube. The silver wires are covered in their upper part, above the chloride of silver and up to the point where they emerge from the vulcanized stoppers, with leaf gutta percha, to isolate them and preserve them from the action of the sulphur in the stoppers. The electromotor force of this battery is to that of a Daniell's battery as 1.03 to 1

A SPLENDID HOLIDAY GIFT.—"Wrinkles and Recipes." See advertisement on another page.

God's First Temples.

Bayard Taylor, in his interesting work entitled "Home and Abroad," in a graphic account of the mammoth trees of California, thus describes the felling of one of the largest specimens of the Sierra Nevada: "After a steady labor of six weeks the thing was done, but the tree stood unmoved, so straight and symmetrical was its growth, so immense was its weight, and so broad its base, that it seemed unconscious of its own annihilation, tossing its outer branches derisively against the mountain winds that strove to overthrow it. A

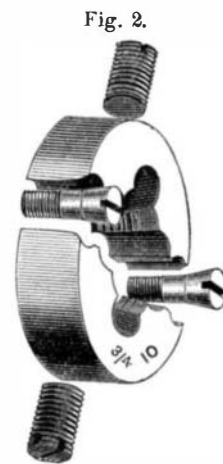
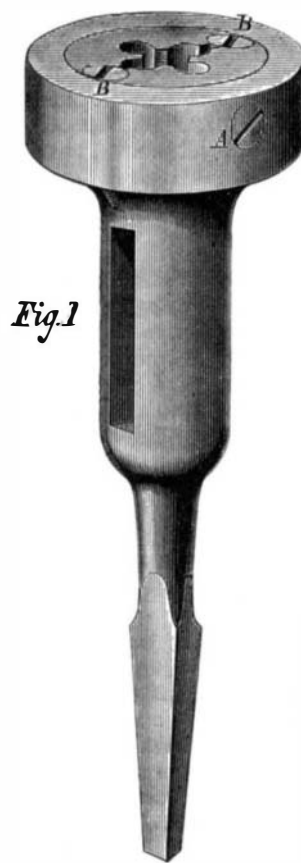
neighboring pine of giant size was then selected, and felled in such a way as to fall with full force against it. The top shook a little, but the shaft stood as before; finally the spoilers succeeded in driving their wedge into the cut. Gradually, and with great labor, one side of the tree was lifted; the line of equilibrium was driven nearer and nearer to the edge of the base; the mighty mass poised for a moment, and then, with a great rushing sigh in all its boughs, thundered down. The forest was ground to dust beneath it, and for a mile around the earth shook with the concussion." The work was performed by two sets of hands with the aid of long pump augers. The tree was a mass of solid wood ninety feet in circumference, containing some two hundred and fifty thousand feet of timber; and according to the annual rings, its age was three thousand one hundred years. The stump is now used for a ball room, and the trunk for a bowling alley. Dr. Bigelow said of this specimen: "It requires thirty-one of my paces, of three feet each, to measure its circumference at the stump; and the mere felling of it cost, at Californian prices for wages, the sum of five hundred and fifty dollars. An idea of the sublime proportions of these wonderful fathers of the forests can be formed after seeing a man on horseback riding a

distance of seventy-five feet through a hollow trunk, and emerging from a knot hole in the side."

IMPROVED SCREW CUTTING DIE AND HOLDER.

We illustrate in the annexed engraving a new adaptation of an improved screw cutting die, made so as to be conveniently held in a bit stock instead of in the ordinary plate. The construction will readily be understood from Fig. 1, and also from the representation of the die taken apart in Fig. 2. The screws shown at A, in Fig. 1, serve to close the parts of the die together from the sides, and the taper screws, B, Fig. 2, spread the die when driven in, thus regulating the size of the cut. By operating either screws, A or B, the portions of the die may be adjusted and held with great nicety, while wear, at the same time, is compensated for in a very simple and effective manner.

The die does its work in a single cut, thus forming the



screw thread at once, neatly and sharply, and without raising the thread above the normal surface of the material operated upon. The die also allows of nuts and bolts for different purposes being made to fit together tightly or loosely, as desired.

For further particulars, address the manufacturers, the Wiley and Russell Manufacturing Company, Greenfield Mass.