NEW DRAUGHTSMAN'S EASEL.

It is well known that draughtsmen, engravers, lithographers, and persons having similar occupations, suffer very much on account of the cramped and unhealthy position they necessarily assume while working on an ordinary table. Mr. G. Boudriot, of Hagen, Germany, has invented an easel which avoids the most serious defects of the ordinary draughting table, and is very convenient. It can be adjusted to almost any desired position It is represented in the annexed engraving, taken from the *Leipziger Illustrirte Zeitung*. The drawing board is suspended from two sliding frames by ropes passing over pulleys on the top of the easel, and it is balanced by a ball weight attached to the ropes, as shown in the engraving.

The board can be inclined at any desired angle by means of adjustable telescoping struts. The easel is provided with adjustable arms, carrying sliding carriages, from one of which a lamp is suspended. A small table for the instruments is suspended from the other. The easel can be adjusted to suit persons of different heights and to accommodate different kinds of work. This table is easily constructed, and it seems to be very convenient and well arranged.

IMPROVED DRAUGHTSMAN'S EASEL.

NEW METHOD OF OPERATING MINING PUMPS.

Our engraving illustrates a novel arrangement for supplying power from a central station to a number of contiguous mines. The invention consists in the employment of hydraulic pressure, generated by steam or water power, and one or more pressure accumulators, the water under pressure being conveyed through pipes to the different mines, where it is used for operating pumps, hoisting and blowing machinery. It is then returned through pipes to a water tank, from which it is again pumped into the accumulator to be used over again.

In operating the pumps at the mines a strong bracket is secured to the ordinary spear or pump rods. A ram or upright hydraulic cylinder is placed under each bracket, so that the piston rod of the cylinder will strike the under side of the bracket, and lift the pump rod when the piston rises. A branch pipe is connected with the hydraulic cylinder below the piston. A waste pipe leads from the hydraulic cylinder to a water tank at the central station, from which the water is pumped into an accumulator. A valve is arranged in the length of the branch pipe near the hydraulic cylinder, and another in the waste pipe; and these valves are operated automatically by the motion of the pump rods so as to open and close alternately, thus admitting the water to and discharging it from the cylinders, giving the pump rods a vertical reciprocating motion.

By this means an entire mining district, when the mines are conveniently situated, can be supplied with a cheaper and more reliable power than when separate engines are used, and the mines will at all times have command of a larger surplus of power, because two or more engines can be maintained at the central station, each of which is sufficient for ordinary work, so that in case one should become disabled the other could be used. By this arrangement, should any of the mines strike a body of water suddenly, then at once the surplus power can be drawn to that particular mine to operate upon the surplus water. Should the power still be inadequate it would take but a short time to add another pump to pump into the same accumulator, and thus furnish all the power required by a drowned mine.

This invention was recently patented by Messrs. Moore & Dickey, of San Francisco, Cal.

Strong Hose Pipe.

At a recent meeting of the Edinburgh Association of Science and Arts, a short communication was made by Mr. William Firth on the use of India rubber hose for steam and high pressure purposes, and exhibited a piece of canvas and rubber hose capable of withstanding a pressure of 4,000 lb. to the square inch, and also several other pieces of canvas and rubber packing, which, he said, were most useful for engineers. Several members spoke favorably of the novel points embodied in Mr. Firth's communication.

MECHANICAL INVENTIONS.

Mr. Richard E. Wilcox, of Hartford, Conn., has patented an improved drill-chuck, so constructed as to hold the work firmly and allow it to be easily inserted and removed. The work is held by the front ends of the jaws, which are made to open or close by turning the exterior case of the chuck.

An improved spark arrester, patented by Mr. Daniel B. Stalker, of New Petersburg, O., consists of three cylindrical wire screens set concentrically one within another, and fixed in a vertical position on the top of a boiler smokestack, and provided with caps and tubes and other devices for aiding in arresting and disposing of the sparks and cinders that may escape from the stack.

Mr. Harrison W. Holley, of Lynchburg, Va., has patented an improvement on a machine for rolling and cutting tobacco for which the same inventor received letters patent No. 209,808, dated November 12, 1878.

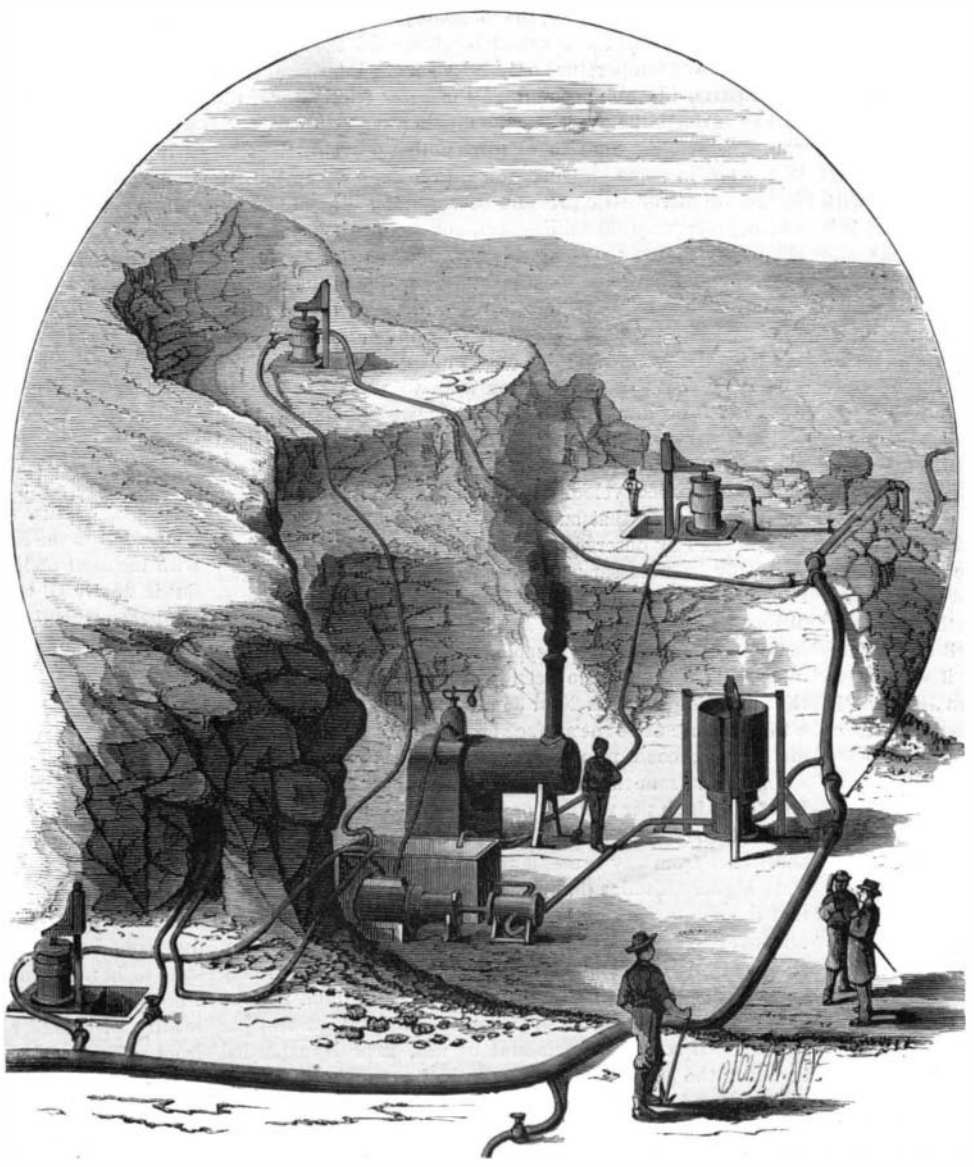
An improved machine for making plug tobacco has been patented by Mr. Edward T. Pollard, of Lynchburg, Va. The object of the invention is to provide means whereby the tobacco may be fed on the inside of a single belt, rolled in a continuous sheet, and cut into plugs; also, to provide means for keeping clean the surface of the large roll over which the tobacco is carried and the inner face of the belt.

Mr. Amos A. Burr, of Rockdale, N. Y., has patented an improved saw so constructed that it cannot be forced forward should its teeth strike a knot or other hard spot in the wood.

An improved wagon brake has been patented by Messrs. John F. Talley and John M. Wadlington, of Uptonville, Ky. The object of this invention is to furnish brakes for wagons and other vehicles so constructed that they may be applied automatically whenever the horses cease to draw.

Mr. Reuben F. Krohn, of Sunbury, Pa., has patented a simple and effective self-coupler whereby cars can be coupled or uncoupled and the link removed without going between the cars.

An improvement in feathering paddle wheels has been patented by Messrs. Thomas C. Pratt and Herman J. S. Lewis, of Grafton, N. Y. The object of this invention is to furnish paddle wheels which shall be so constructed that the paddles will adjust themselves automatically to bear equally against the water when moving through one part of the revolution and edgewise when moving through the other part of the revolution, so that the most of the power may be utilized for the propulsion of the vessel.



IMPROVED METHOD OF OPERATING PUMPS.

The Little Snow Plow.

Mountain locomotives have two enemies—the falling rock and the snow slide. Both these are successfully vanquished by means of a simple invention termed "the little snow plow." It consists of a concave triangular piece of boiler iron, which fits snugly over the pilot. It is perhaps two feet in height, with a sharp angle in front, and sides which reach backward and outward over the rails. It tosses aside with the utmost ease a foot or two of snow, and so demoralizes an ordinary drift that an engine has no difficulty in passing through. But the peculiar forte of these iron shields is wrestling with huge rocks and bowlders which these warm spring days detach from the mountain sides. Rolling down the slippery banks and lodging squarely upon the track, these savage rocks seem fully bent upon wrecking the trains and landing the passengers in the eddies of the river. The train comes sweeping around the curve all unconscious of the perilous bowlder, and the watchful eyes of the engineer catches a glimpse of the fatal train-wrecker too late to avert the danger. But the little snow plow is wide awake and ready for business. Backed by the ponderous engines and swift-moving train, it catches the rock and hurls it twenty, forty, fifty feet into the air. Rocks that weigh five hundred pounds are thrown as easily as the foot trips a pebble from the sidewalk. Engine 181, with one of these plows, cleared the track of a bowlder which weighed over half a ton. There is no shock which is perceptible to those on the train, but when the next station is reached the heavy iron on the little snow plow is found to be dented as if it had been struck by a cannon ball.—*Truckee Republican.*

Brown Stone as a Fire Resister.

Notice was taken a short time ago of the investigations of Dr. Cutting, State Geologist of Vermont, in determining the relative power of different granites to withstand the action of fire. He has since examined and reported upon the class of building stones known as brown stones, free stones, and sandstones. He found them to withstand heat much better than granite. Of the twenty-three specimens tested, not one was injured at 600°, and only three were slightly injured at 800°. At 900° the effects of the heat were very generally and seriously shown, but so many as seven varieties were reported as "standing well" temperatures even