

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.

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.

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.

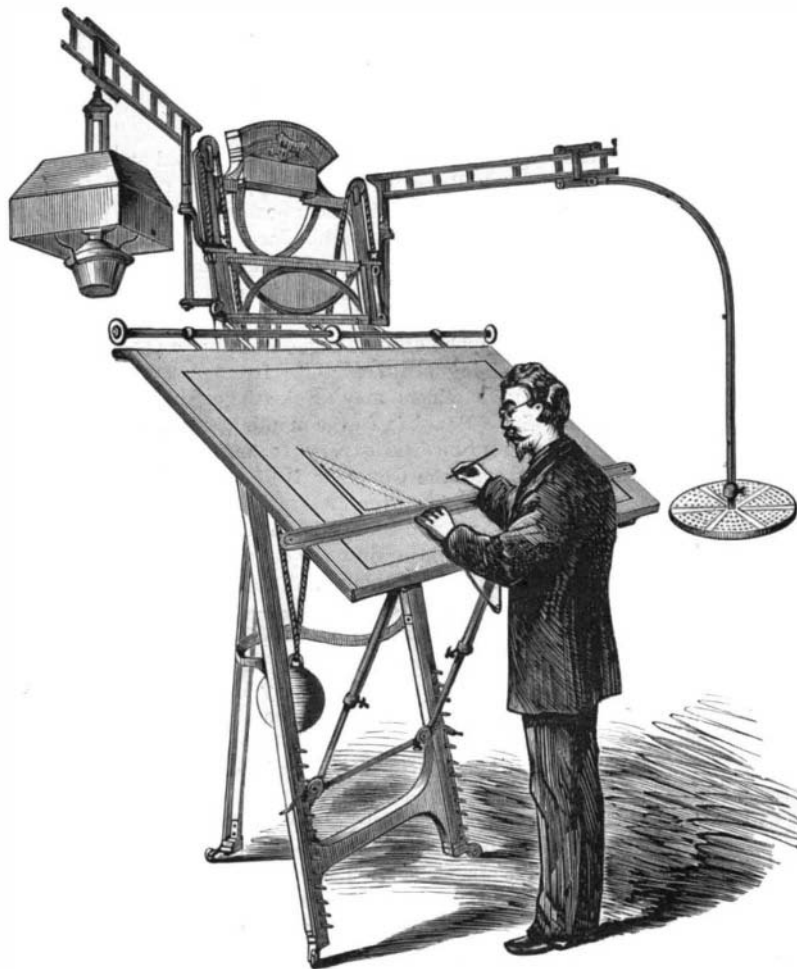
An improvement in feathering paddle wheels has been patented by Messrs. Thomas C. Pratt and Herman J. S. Lewis, of Grafton, N. Y. The object of this invention is to furnish paddle wheels which shall be so constructed that the paddles will adjust themselves automatically to bear equally against the water 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.

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 boulders 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 boulder, 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 boulder 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.

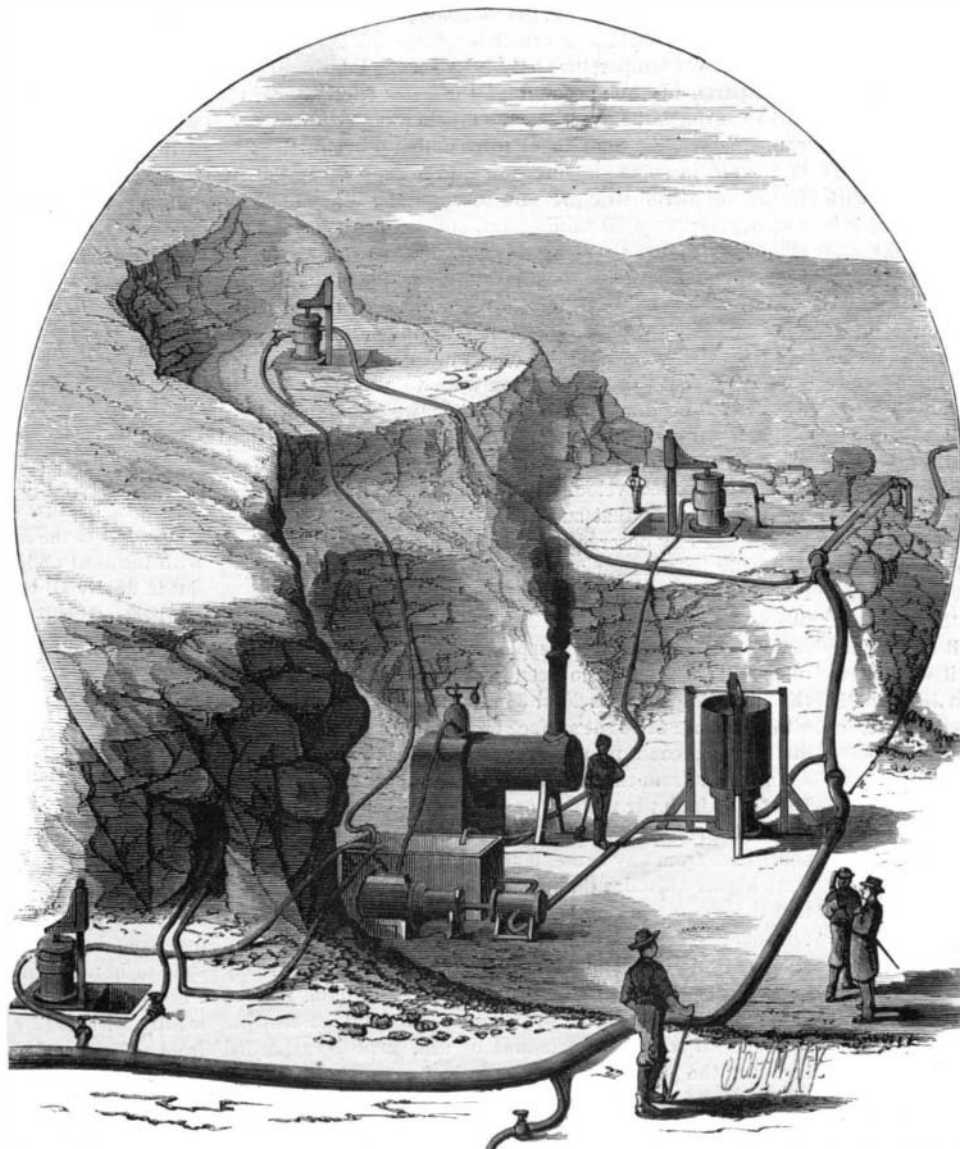
Notice was taken a short time ago of the investigations of Dr. Cutting, State Geologist of Vermont, in determining the relative power of different granites to withstand the action of fire. He has since examined and reported upon the class of building stones known as brown stones, free stones, and sandstones. 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

**IMPROVED DRAUGHTSMAN'S EASEL.**

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 improved method of operating pumps. The invention 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.

**IMPROVED METHOD OF OPERATING PUMPS.**

higher than 1,000° Fah. "Montrose stone," from Ulster county, N. Y., is one of those which stood the test of 1,000°. These investigations were made at the instance of the *Underwriter*.

AGRICULTURAL INVENTIONS.

An improved seed planting machine, patented by Mr. Albert Dart, of Richmond, Va., consists in combining with a seed dropper mechanism a flat rimmed wheel and rim grooved roll, and in arranging a supporting wheel on a two-part shaft between the two sections of a seeder.

An improvement in the class of cotton choppers having one or more hoes operated by a crank or similar means, and working across the rows of plants, or at right angles to the direction in which the machine advances, has been patented by Mr. John T. Sustaie, of Matthews, N. C.

Mr. Benjamin M. Watts, of Phoenix, Arizona Ter., has patented a portable baling press, which is so constructed as to be moved from place to place about a field in which hay has been cut, and bale the hay as it lies in the windrows, where it has been left by the rakes. There is no necessity of bringing the hay to the press or transporting and stacking a quantity in one place, so as to save moving the press. This is the prime or paramount object of the invention, the peculiar combination and construction being such that these results are obtained by the minimum of expenditure of time, labor, and money.

Mr. Robert L. Turner, of Olena, Ohio, has patented an improved hand hoe of that form in which a short handle carries a bent blade adapted to universal use in the cutting away of grass or manipulating the soil about plants; and it consists in the peculiar form of the blade, which is constructed of a main body portion setting off to one side of the longitudinal axis of the handle in a parallel plane therewith, and a curved or upturned end portion, which, as well as the main portion, is sharp upon both edges.

Mr. George Metcalf, of Lelend, Ill., has patented a cheap and simple machine for grinding feed for cattle, horses, etc., that is designed more particularly to be operated by windmills having a crank motion.

Mr. Samuel Huber, of Danville, Pa., has patented a plow colter to be attached to the inner or furrow face of the plow beam in such a manner that the colter shall cut the grass from the edge of the turf that is to be turned over by the plow, so that the grass shall not protrude upward between the turned furrows.

Alisoff's Copying Process.

Instead of using a tray filled with a compound to receive the ink, M. Alisoff employs sheets of prepared paper. This polygraphic paper is prepared in the following manner: Sized or unsized paper is coated on one side with a composition consisting of glue, or gelatine, glycerine, soap, and water, approximately in the following proportions, which have been found to give good results in practice: 80 pounds animal glue or gelatine, 20 pounds glycerine, 20 pounds soap, 200 pounds water.

The paper thus prepared may occasionally be found to be too sticky for use, which will depend on the surrounding temperature and the quality of the materials employed. To obviate this objection wash the prepared paper with a solution of alum, the strength of which can only be determined by experiments in each case. The "polygraphic paper" may be of different thicknesses, and if not transparent may be made so, if desired, by any of the ordinary and well known means. The aniline ink, found to give the best results for written documents, is prepared by preference by dissolving about 1 pound of aniline of commerce in about 1½ pounds of alcohol, and adding thereto, when dissolved, as much water as is necessary to render it sufficiently fluid. It may then be bottled for use.

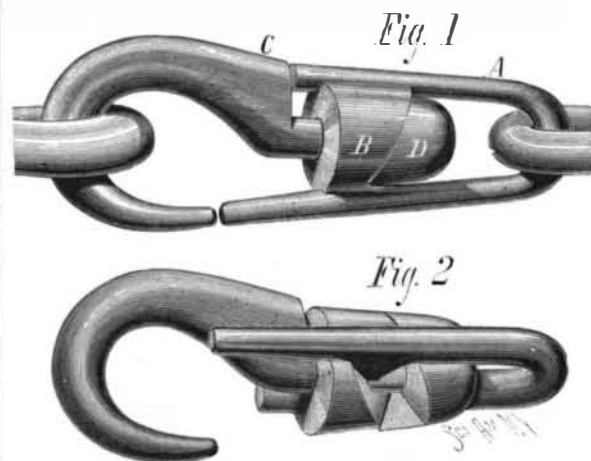
In producing the "matrix" the patentee takes a sheet of prepared or "polygraphic" paper, and lays it on a sheet of damp flannel or cloth placed upon a zinc plate or an oil paper. He sponges it with clean water, or, in hot weather, with water containing a little alum, and places the dry original upon the prepared paper. Over that he places another piece of damp flannel zinc, or oil paper, and puts the whole pile into an ordinary copying press. A good matrix can be obtained by mere pressure of the hands without a press, although a press is preferable. The text must be written, drawn, or printed with aniline ink, taking care that the pen be quite clean and always full of ink. The ink when dry ought to shine like a metallic surface. In taking copies from the "matrix" after having detached the original therefrom, the patentee places a sheet of ordinary paper in the place of the original, and proceeds in the same way as when producing the matrix; but if copies or "matrices" are to be taken from 2, 4, 6, or 8 pages at once he places a sheet of damped "polygraphic paper" on each page with damp flannels and zinc sheets between the leaves of "polygraphic paper," and proceeds in the way above described.

The polygraphic paper may be bound into copying books which can be used like ordinary copying books made of tissue paper, and copies on ordinary paper may be taken from the "matrices" thus preserved, even after a considerable time. After a few copies have been taken the written text can be read from the reverse side of the "matrix," as in ordinary copying books. Should it be found desirable to obtain manifold copies of printed matter this may be accomplished by employing in combination with "polygraphic" or prepared paper, aniline printing ink, prepared in the fol-

lowing manner: Take equal parts by weight of aniline and glycerine and boil them together till the aniline is dissolved, and the composition has attained sufficient consistency to be used in the manner of printer's ink. Ink so prepared will be found particularly useful for printing the headings of letters, bills of lading, declarations, letters of invitation, circulars, and other documents containing both written and printed matter, since if aniline ink be used for both the printing and writing the copies will contain both the printed and written matter, while heretofore only the writing could be copied, the printing ink hitherto employed not being transferable.

NEW SELF-LOCKING HOOK.

We give herewith an engraving of an improved self-locking hook recently patented by Mr. Joel R. Haines, of Mount Laurel, N. J. These hooks are so constructed that the weight of traces or any other tension or strain will hold them securely locked, so that they cannot accidentally become unhooked.



HAINES' SELF-LOCKING HOOK.

Fig. 1 shows the hook in its normal condition, and Fig. 2 represents it as unfastened.

The two arms of the loop, A, are connected by a collar, B, having on one of its sides two ratchet or clutch teeth, which are engaged by two similar teeth on the head, D, on the shank of the hook, C.

The shank is capable of turning in the collar, B, and as it is turned it is retracted by the action of the inclined faces of the ratchet teeth on the collars, D B, and when strain is put on the hook the tendency of these inclined faces is to turn the hook in the opposite direction.

The ends of the loop, A, are elongated so as to project beyond the collar, B, one arm projecting far enough to nearly touch the point of the hook when locked; the other arm nearly touches the shoulder at C.

Any longitudinal strain tends to keep the hook fastened, and it can be unfastened only by relieving it from strain. This device is applicable not only to harness, but to all kinds of rigging and tackle employing ropes, chains, or straps.

All communications in relation to this invention should be addressed to Mr. Louis T. Drouse, Camden, N. J.

NEW REFRIGERATING COVER.

The annexed engraving represents an improved refrigerating cover recently patented by Mr. Abijah North, of



NORTH'S REFRIGERATING COVER.

Champlain, Clinton County, N. Y. It is designed to be placed over victuals or over dishes containing them, and may be made so small and compact that it may be conveniently used on the table for cooling butter and other articles.

The invention consists of a can having in its lower portion an annular chamber, A, upon which rests a pan, B,

which does not quite cover it, and in the pan is placed a basin of perforated metal or wire cloth for containing the ice. The entire device is closed by a cover at the top, and made airtight or nearly so at the bottom by a ring of rubber tubing that surrounds the lower edge of the annular chamber, A. As the ice melts in the basin, C, the water drops into the pan, B, from which it runs into the annular chamber, A. The chamber is provided with a small outlet for air, and with a faucet for drawing off the water accumulating in it.

This refrigerating cover may be placed over small dishes or over articles contained by larger dishes, as shown in the engraving. It will be noticed that both the ice and the ice-cold water resulting from the melting of the ice are utilized in refrigeration.

Astronomical Notes.

OBSERVATORY OF VASSAR COLLEGE.

The computations in the following notes are by students of Vassar College. Although merely approximate, they will enable the observer to recognize the planets. M. M.

POSITIONS OF PLANETS FOR JUNE, 1880.

Mercury.

On June 1 Mercury rises at 4h. 26m. A.M., and sets at 7h. 21m. P.M.

Mercury is approaching its greatest eastern elongation, and should be looked for after the 15th of the month, in the evening twilight, about 2° north of the point of sunset.

On June 30 Mercury rises at 6h. 34m. A.M., and sets at 9h. 7m. P.M.

Venus.

Venus is approaching superior conjunction, and is so nearly in range with the sun that it is not likely to be seen during June.

Mars.

Mars is more and more distant from us; but its reddish light enables one to distinguish it from the stars.

On June 1 Mars sets at 10h. 50m. P.M.

Mars will be seen near the new moon on the 11th; the moon will pass east of Mars and below the planet in altitude.

Jupiter.

On June 1 Jupiter rises at 1h. 53m. A.M.

It is near the waning moon on the morning of June 2.

On June 30 Jupiter rises at 0h. 10m.

It is in conjunction with the moon; the moon passes north of the planet. This planet is now near enough for us to examine the changes of its satellites.

On the morning of June 23, between 2 and 4, the first satellite and its shadow may be seen on the disk of Jupiter.

Saturn.

On June 1 Saturn rises at 2h. 28m. A.M.

Saturn passes the star Omicron Piscium on the 7th. The star is one degree further north in declination.

On June 30 Saturn rises at 0h. 40m. A.M., closely following Jupiter, about three degrees further north.

Uranus.

Uranus rises on June 1 at 11h. 8m. A.M., and sets at 23m. after midnight.

On June 30 Uranus rises at 9h. 18m. A.M., and sets at 10h. 31m. P.M.

Uranus is moving away from the star Rho Leonis in right ascension, and approaching it in declination. It is about one degree east of the star.

A telescope of four inches aperture will show that Uranus has a pale greenish-white disk; it appears like a very small full moon.

Sun Spots.

The long period of quiet on the sun's surface has ended. The spots follow one another now in rapid succession. A group composed of some dozen spots was approaching the western limb of the sun late in April, when there entered upon the eastern limb a large and densely black spot, surrounded by the usual gray bordering, and accompanied by several others smaller in size. This is undoubtedly a return of that seen about the middle of April; the different members so numerous at that time seem to have united. This spot should be looked for early in June.

Hydraulic Mining on a Railway.

Recently heavy slides of earth seriously obstructed the track of the Central Pacific Railway above Alta, California. The mass of earth to be removed was so great that by ordinary methods several weeks would have been required to clear it away. In the emergency hydraulic miners were called upon for help. They brought up their pipes and monitors, constructed a flume from a ditch which was, fortunately, near at hand, and in fourteen hours piped away a body of debris which had been the despair of picks and shovels. The tremendous power of hydraulic mining was thus exhibited in a very practical way. Those who witnessed the swift dispatch of this avalanche of earth have attained, says the *Sacramento Union*, a lively perception of the effects produced upon the bluffs which contain the gravel deposits. It is, indeed, somewhat singular, the *Union* continues, that the hydraulic monitor has never been used in making cuts on railways where the soil is sufficiently soft to be piped. It might be thought that in such cases there would be great economy in the application of water power, for a strong head of water directed by an experienced hand will cut out and carry away more dirt in one day than fifty men could shovel and pick in a week.