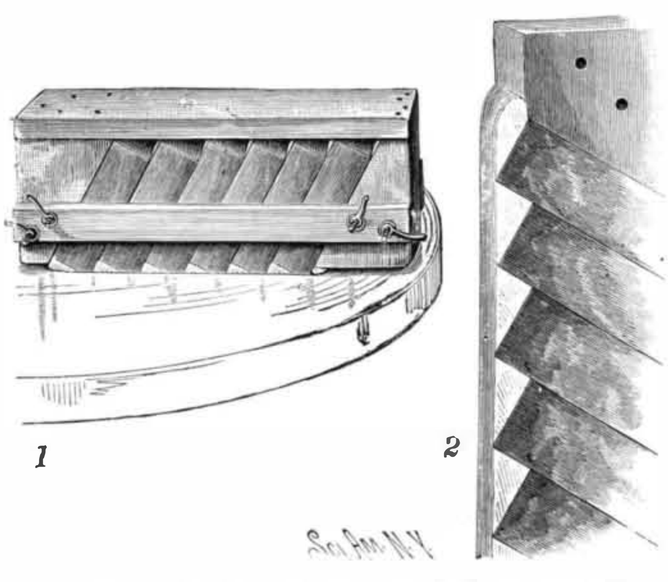
NEW METHOD OF CHAMFERING STONE.

The usual method of chamfering stone is to chip off the corners by means of a mallet and chisel, and afterward to grind and polish the surfaces separately, thus involving a great amount of labor and much expense.

Mr. John L. Dalot, of Addison, Me., has recently patented a novel method for producing chamfers upon the edges of stone blocks and slabs without liability of chipping the corners. According to this method, the slabs are mounted in a frame which holds them at the required angle, and the edges of the blocks or slabs to be chamfered are covered with a suitable cement, which fills in the angles between the blocks, and sustains the surface of the stone so that it does not chip in the process of grinding. Any suitable cement is used for this purpose; plaster of Paris has been found effectual and convenient. The arrangement of the slabs in the frame is shown in Fig. 1, and in Fig. 2 the slabs thus prepared are shown in position on the lap which carries the abrasive and polishing material.

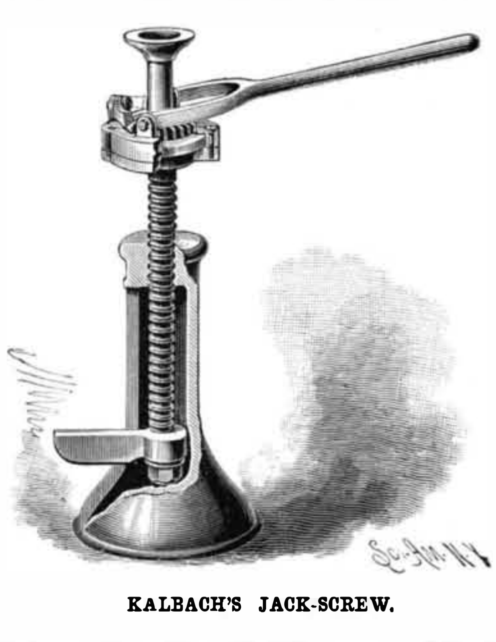


DALOT'S APPARATUS FOR PRODUCING CHAMFERS.

It is obvious that this improvement is equally applicable in hand polishing, where an ordinary hand rubber is used. The chamfers produced according to this method are uniform, the angles are sharp, and the surfaces plane.

IMPROVEMENT IN JACK-SCREWS.

We give an engraving of a jack-screw which is designed to operate in much the same manner as the well known hydraulic jack. The screw turns in a nut in the standard, and carries at its upper end a flange and ratchet wheel. The screw-operating lever is pivoted to a movable ring inclosing the flange, and the movable ring carries a pawl for engaging the ratchet. The upper end of the screw is prolonged, and furnished with a shoe for receiving the load when it is desired to apply pressure from the upper end of the screw. Upon the lower end of the screw is swiveled an arm which extends through a slot in the standard, for engagement with objects to be lifted from the ground. By oscillating the lever, the ratchet is engaged by the pawl and carried around, thus turning the screw and raising or lowering the object supported by it. The pawl may be reversed so as to turn the screw in either direction.



KALBACH'S JACK-SCREW.

This invention has been patented by Mr. M. D. Kalbach, of Harrisburg, Pa.

In relation to his scheme for a tubular railway across the Straits of Dover, Sir E. J. Reed points out that, unlike the tunnel, the tube can be destroyed if required by torpedoes or mines by the fleet, and hence could never be used by an enemy to maintain the communications of an army of invasion.

Artesian Wells.

Whether water can be obtained by artesian borings in any district, or not, depends upon the geological structure. All rocks contain more or less water. Sandy formations absorb water mechanically, and fine sand can take in about one-third of its bulk of water, and if a well be sunk into it, and regularly pumped from, nearly all of this moisture can be drawn out. Chalk, and similar rocks, which are made up of very fine particles, closely compacted together, contain a very large proportion of water, but from the capillary attraction of this rock, very little of this water will drain into a well sunk into it. But as there are often wide crevices in chalk rocks, through which water flows in much greater quantity than the rock can retain in its pores, wells sunk into chalk formations often secure water. There is another formation, that of the clays, through which water does not percolate, and a well sunk in this rock cannot secure water. In the geological strata of the earth, the veins which are impervious to water and those through which the water readily penetrates may occur in alternating layers, and when in this manner a pervious bed of earth lies between two impervious ones, it is plain that we have a formation altogether favorable to the objects of the artesian well. For, if a perforation be made through the retentive rock, into the water-logged strata below, the moisture there contained will rise through the bore to a height depending upon the pressure of water which has accumulated in the confined space between the two impervious veins.

When, as so often happens, especially when the surface of the country is uneven, the vein of water-yielding sand may run beneath the surface of the earth, to a level far above the point where the boring has been made, the water will rise rapidly in the well, to the surface of the earth, and often higher, and will then flow continuously by hydrostatic pressure. As veins of sand or pervious rock run through the earth everywhere, there seem to be few places where the process of boring cannot secure water at less or greater depth. Many artesian wells have been made in the deserts; in the Sahara a number of wells made in this way are transforming a perfectly arid land into a fertile, beautiful country. And as surface waters are continually percolating into the strata from which the artesian well draws, such wells seldom fail, even after many years of usage. There are such wells in the Old World that have been in use for centuries.—*Chicago Inter-Ocean.*

OPEN COLUMN MANOMETER ON THE EIFFEL TOWER.

M. L. Cailletet, the eminent French physicist who has become famous for his researches on the liquefaction of gases, has put the Eiffel tower to a new use. As a verifier of high pressure instruments the open column mercury manometer has been found unsurpassed. Already M. Cailletet has used one over three hundred feet high. In the Eiffel tower he has recently established one three hundred meters in height, giving unrivaled opportunities for standardizing high limit pressure gauges.

As a glass tube could not be constructed that would be practical under so great a pressure, a soft steel tube was adopted. This was carried up the tower and secured thereto as shown. It is about 4 millimeters (0·16 inch) in internal diameter. It is attached to one of the rails of the inclined elevator until the lower platform is reached. A stairway was constructed along the line it follows. A portion of this section is shown in the cut. Then, by a series of vertical and almost horizontal elements, the tube makes its way to the second platform, whence its rises vertically, except for one break, to the top of the tower.

The lower end of the tube enters a vessel of mercury and is immersed in the same. By pumping water into this vessel, the mercury is forced up into the tube.

As it would be manifestly impossible to read the level of the mercury in the opaque tube, a series of auxiliary open glass reading tubes is connected to it at intervals. These communicate through a lateral connection with a stop cock with the main tube. If the cock of one of the connections is open as the mercury reaches the level of the auxiliary tube, it rises in it to the same level.

Telephonic communication is maintained between the observer at the tube and the manometric station, by which the movements of the pump and escape valve are directed. If too much water is pumped in, a little is allowed to escape. As the point is nearly reached, the pump is worked very slowly, so that, by practice, the exact point can be reached nearly every time. An overflow tube is provided in case any of the mercury escapes. After a reading the cock is closed if higher pressure readings are to be taken, and the mercury is pumped up to the next desired auxiliary reading tube.

The manometric station, whose interior in shown in our illustration, is situated at the base of the western pillar of the tower. The observation or auxiliary tubes are known by number, and besides carry each an independent graduation. In practice the pump is caused to force the column up to a tube of a certain number and to a definite graduation on the scale of the same tube.

In this way high pressure gauges can be graduated up to 400 atmospheres. Of course the reliability of the method depends on the accuracy of the levels of the reading tubes. Special care has been taken to determine these levels.—*Illustration.*

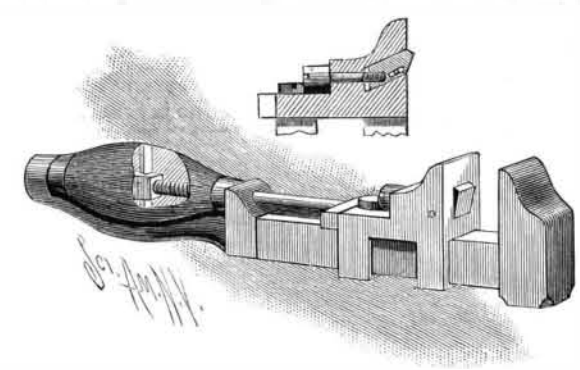
Healthy and Vigorous at 104.

Mrs. Mehitable Dayton, the oldest person in Connecticut, celebrated her 104th birthday on May 1. Mrs. Dayton received her guests sitting in a chair which is 150 years old. She is a remarkably well preserved woman, and does not look over 70 years. She is perfectly healthy and vigorous. Mrs. Dayton was born May 1, 1787, the eldest of nine daughters of Samuel and Mary Stratton, who lived but a few rods north of the house in which she now resides. Each of her sisters married, and each lived in a different State. There are two other sisters now living—Mrs. Dolly Morgan, of Holly, N. J., aged 91, and Mrs. Electa Haskell, of Otis, Mass., aged 89. On December 14, 1806, she married Ezra Dayton, of Marlboro, who was also one of ten children. They had ten children, two of whom are now living.

AN IMPROVED WRENCH.

We give an engraving of a new wrench recently patented by Mr. Frank S. Chaney, of Honolulu, Hawaiian Islands. This wrench is designed for applying and removing nuts of various kinds, and to holding and turning round objects such as rods and pipe. The construction of the wrench, as will be seen by reference to the engraving, is simple and comparatively inexpensive. The shank and thread are formed integrally of a single piece of steel, and a sliding jaw, which is fitted to the shank, is made of steel by the usual method of drop forging.

In the face of the jaw is an oblique mortise in which is placed a pawl of hardened steel, which is adjusted in the mortise by a screw, as shown. When the wrench is to be used upon nuts or square objects, the pawl is withdrawn into the mortise, but when it is to be used upon round objects, the pawl is projected beyond the face of the movable jaw. The lower end of the shank is curved and bent at a right angle to receive the pivotal screw of the handle. The handle contains a nut which receives a rod connected with the movable jaw, and the rod is guided by a clip attached to the straight portion of the shank. By turning the handle in one direction or the other the required adjustment of the movable jaw is secured.



CHANEY'S WRENCH.

The Breathing of a Locomotive.

The "breathing" of a locomotive—that is to say, the number of puffs given by a railway engine during its journey—depends upon the circumference of its driving wheels and their speed. No matter what the rate of speed may be, for every one round of the driving wheels a locomotive will give four puffs—two out of each cylinder, the cylinders being double. The sizes of driving wheels vary, some being 18, 19, 20, and even 22 feet in circumference, although they are generally made of about 20 feet. The express speed varies from 54 to 58 miles an hour. Taking the average circumference of the driving wheel to be 20 feet, and the speed per hour 50 miles, a locomotive will give, going at express speed, 880 puffs per minute, or 52,800 puffs per hour, the wheel revolving 13,200 times in 60 minutes, giving 1,056 puffs per mile.

The Electric Omnibus.

A curious incident was lately witnessed in Palace Yard, Westminster, London. About four o'clock an electric omnibus started from the St. Stephen's Club, and carried some dozen members of Parliament round to the members' entrance in Palace Yard. Admiral Mayne was in charge of the omnibus, and among the passengers were Sir William Marriott, Sir Walter Foster, Major Waring, Mr. Majoribanks, and Sir William Walrond. The arrival of the car attracted a large crowd of members, and subsequently a series of trips was made round the neighboring streets, some hundred members in all availing themselves of the opportunity of testing the practical utility of the omnibus.