THE CHILIAN NITRATE OF SODA MINES AND WORKS.

The two nitrate oficinas or establishments of Jaz Pampa and Paccha count among the most important, and are undoubtedly the most picturesquely situated, of any on the pampas or plains of Tarapaca. They are built on opposite sides of a deep quebrada or gulch, through which the Nitrate Railway passes. Indeed, the word Jaz, a local term implying divided, is here used to denote the fashion in which the level surface of the pampa has been rent apart by some bygone convulsion of nature.

Advantage has been taken of this natural formation to lay out the oficinas of the Jaz in such wise as to obtain unusual facilities for commodious and economical working. The caliche or raw material of nitrate, having been extracted from the calicheras or pockets situate on the pampas, is brought to the crushers erected at the edge of the gulch or summit of the maquina, and, being run through them, falls into the boiling tanks below. The nitrate in solution flows into the bateas or precipitating tanks, where on cooling it crystallizes, while the earthy refuse, or ripio, left in the boiling tanks, is cleared out by hand, and shot from tip cars into the valley below.

The washed and prepared nitrate is then bagged and transported to the shipping port of Pisagua, where a fleet of vessels is generally anchored to receive and convey the product to all parts of the world. At this port there are piers alongside of which launches are brought into which the nitrate bags are dumped and towed out to the ships. Quite a large part of the shipment, however, is effected by means of balsas or small floats, consisting of a pair of tubular skins, lashed together and inflated with air. These balsas are very buoyant, very light, easily propelled. The manner of loading and propelling them is clearly shown in our engraving. The native boatmen are exceedingly dexterous at the business, and are satisfied with earnings of a few cents a day.

We are indebted to the *Illustrated London News* for our engravings.

SIMPLE MILLING ATTACHMENT FOR FOOT LATHES.

The plan of making one machine answer the purpose of several separate machines for different purposes is not advisable, for many reasons; but when a simple and useful attachment, like that shown in the engraving, can be readily and cheaply made without altering the lathe, and arranged for use without waste of time, it is desirable, especially when the use of such an attachment effects a great saving of time, and takes the place of files in many kinds of work.

The milling attachment here shown is applied to the small engine lathe (8 inch swing, 42 inch bed) made by W. C. Young & Co., of Worcester, Mass., as this lathe is well fitted for the purpose, but it may of course be applied as readily to other lathes fitted with the same slide rest, and with some changes it may be adapted to almost any engine lathe.

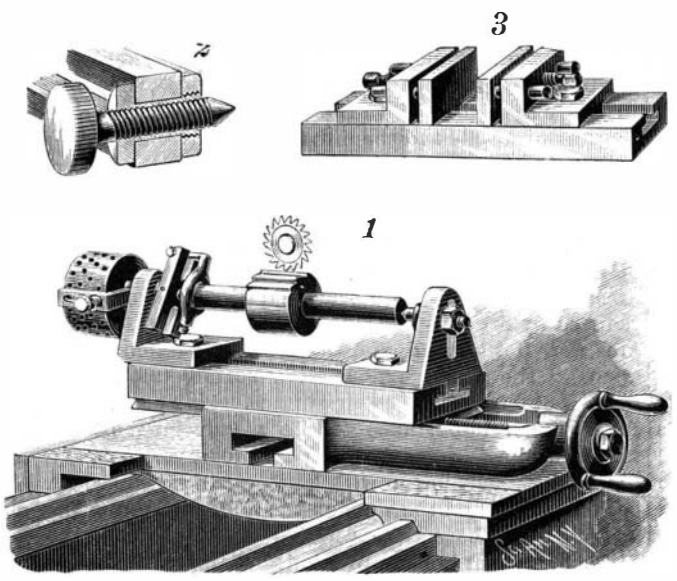
The slide rest illustrated is inverted, and the part which is designed to hold the tool post is secured to the lathe carriage by the bolt that commonly holds the slide rest in the position of use. The bottom of the slide rest, which is thus placed uppermost, forms a bed of sufficient size for receiving work as large as would usually be done in a lathe, and the T slot furnishes a ready means of securing the work or the holders for the work. In Fig. 1 two angle plates are shown secured to the slide rest by bolts entering the T slot. The upright portions of the angle plates are slotted to permit of adjusting the centers at the desired height. The fixed center is held in place in one of the angle plates by nuts on opposite sides of the plate. The movable center is supported in the other angled plate by a sleeve which passes through the slot in the plate.

The inner end of the center carries an H-shaped bar, which clamps the end of the dog on the mandrel which holds the work. The outer end of the movable center is provided with small cylinder divided like an index plate. The outer nut on the sleeve which supports the movable center has a slotted right-angled arm, which extends outwardly and along the face of the graduated cylinder. In the slot of the arm is clamped a sleeve, in which is inserted a screw with a conical point, which may be inserted in any of the holes in the graduated cylinder, the screw being adjustable along the slotted arm to bring it opposite any series of holes as may be required.

The division of the cylinder may be effected with sufficient accuracy for most purposes by means of dividers, but more accurate results may be secured in the manner described in SUPPLEMENTS No. 317, 732, 740.

Taps, reamers, and cutters may be fluted by the aid of this simple and easily made apparatus, the cutter being carried by the lathe either on a mandrel between the centers or projecting from a chuck on the lathe mandrel.

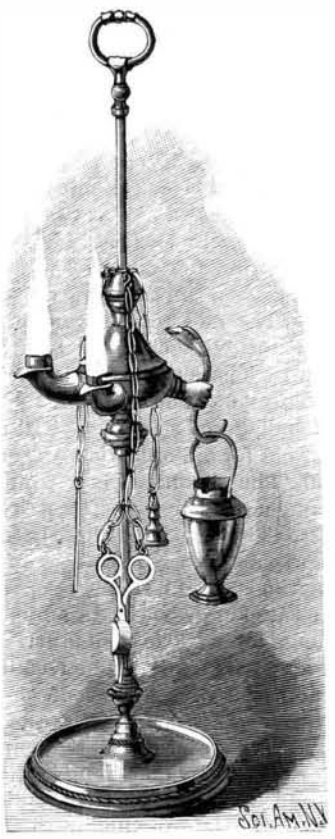
For plain work, the simple vise, shown in Fig. 2, may be used. If the work to be done is too large to go between the slide rest and cutter, it will be necessary to raise the head of the lathe. If, on the other hand, the slide rest is too low, it may be raised by inserting washers between the rest and lathe carriage. To facilitate placing these washers, they should be slit from the center outward to the periphery, to allow of putting them in place without removing the bolt from the slide rest and lathe carriage.



MILLING ATTACHMENT FOR FOOT LATHES.

OLIVE OIL LAMP.

The lamp shown in the engraving was recently purchased in the *Mercato Vecchio* at Florence. These



OLIVE OIL LAMP.

lamps are used not only in Tuscany, but in many of the other provinces of Italy, and form an article of commerce not only for actual use, but being so artistic, large numbers are sold annually to European travelers as souvenirs. They are quite inexpensive, considering the amount of material and the work put upon them, the larger ones costing only $1.35 complete, while small ones may be purchased for 75 cents. They show an amount of hand work which is seldom seen in American goods of the same class.

These lamps are made in several different designs and with one, two, three, or even four beaks. The lamp illustrated is 22 inches high and is made throughout of cast brass, with the exception of the extra oil carrier, which is of copper. Every lamp is provided with a pair of snuffers, an extinguisher, and an instrument for picking the wick. These three articles are suspended from the lamp with brass chains having brazed links. The lamp font is tinned on the inside to prevent corrosion, and is arranged to slide up or down the rod. The wicks, which are of wool, pass through small brass tubes inserted loosely in the beaks. The supply of oil contained in the font being limited, the small oil reservoir holding a charge of oil is suspended from the lamp. The olive oil, which is very cheap, costing only 8 to 10 soldi (8 to 10 cents) the liter, is manufactured from small olives or those unfit for eating. These lamps give a soft, pleasant light.

Food before Sleep.*

Many persons, though not actually sick, keep below par in strength and general tone, and I am of the opinion that fasting during the long interval between supper and breakfast, and especially the complete emptiness of the stomach during sleep, adds greatly to the amount of emaciation, sleeplessness and general weakness we so often meet.

Physiology teaches that in the body there is a perpetual disintegration of tissue, sleeping or waking; it is therefore logical to believe that the supply of nourishment should be somewhat continuous, especially in those who are below par, if we would counteract their emaciation and lowered degree of vitality; and as bodily exercise is suspended during sleep, with wear and tear correspondingly diminished, while digestion, assimilation and nutritive activity continue as usual, the food furnished during this period adds more than is destroyed, and increased weight and improved general vigor is the result.

All beings except man are governed by natural instinct, and every being with a stomach, except man, eats before sleep, and even the human infant, guided by the same instinct, sucks frequently day and night, and if its stomach is empty for any prolonged period, it cries long and loud.

Digestion requires no interval of rest, and if the amount of food during the twenty-four hours is, in quantity and quality, not beyond the physiological limit, it makes no hurtful difference to the stomach how few or how short are the intervals between eating, but it does make a vast difference in the weak and emaciated one's welfare to have a modicum of food in the stomach during the time of sleep, that, instead of being consumed by bodily action, it may during the interval improve the lowered system; and I am fully satisfied that were the weakly, the emaciated, and the sleepless to rightly take a light lunch or meal of simple, nutritious food before going to bed for a prolonged period, nine in ten of them would be thereby lifted into a better standard of health.

In my specialty (nose and throat) I encounter cases that, in addition to local and constitutional treatment, need an increase of nutritious food, and I find that by directing a bowl of bread and milk, or a mug of beer and a few biscuits, or a saucer of oatmeal and cream before going to bed, for a few months, a surprising increase in weight, strength, and general tone results; on the contrary, persons who are too stout or plethoric should follow an opposite course.

Soldering of Glass and Porcelain with Metals.

Mr. Cailletet has recently made known to the Societe de Physique a process of soldering glass and porcelain with metals. Mechanists, physicists, and chemists will appreciate the practical importance of this process, which permits of adapting any metallic object whatever (cock, tube, conducting wire, etc.) to experimental apparatus in such a way as to prevent any leakage, even under high pressures.

The process is very simple. The portion of the tube that is to be soldered is first covered with a thin layer of platinum. This deposit is obtained by covering the slightly heated glass, by means of a brush, with very neutral chloride of platinum, mixed with essential oil of chamomile. The oil is slowly evaporated, and, when the white and odoriferous vapors cease to be given off, the temperature is raised to a red heat. The platinum is then reduced and covers the glass tube with a bright layer of metal. On fixing the tube thus metallized, and placed in a bath of sulphate of copper, to the negative pole of a battery of suitable energy, there is deposited upon the platinum a ring of copper, which should be malleable and very adhesive if the operation has been properly performed.

In this state, the glass tube covered with copper can be treated like a genuine metallic tube and be soldered by means of tin to iron, copper, bronze, platinum, and all metals that can be united with tin solder.

The resistance and strength of such soldering are very great. Mr. Cailletet has found that a tube of his apparatus for liquefying gases, the upper extremity of which had been closed by means of an ajutage thus soldered, resists pressures of more than 300 atmospheres. The tube, instead of being platinized, may be silverized by raising the glass covered with nitrate of silver up to a heat bordering on red. The silver thus reduced adheres perfectly to the glass, but numerous experiments have caused platinizing to be preferred to silverizing in the majority of cases.—*La Nature.*

Eczema from the Virginian Creeper.

The *Lancet* (London) relates a number of unmistakable cases of eczema produced from gathering leaves of the Virginian creeper. The effect, rash, heat, and irritation of the skin, is the same as that caused by ivy and dogwood on some persons.

* Dr. Wm. T. Cathell, in the *Maryland Medical Journal.*