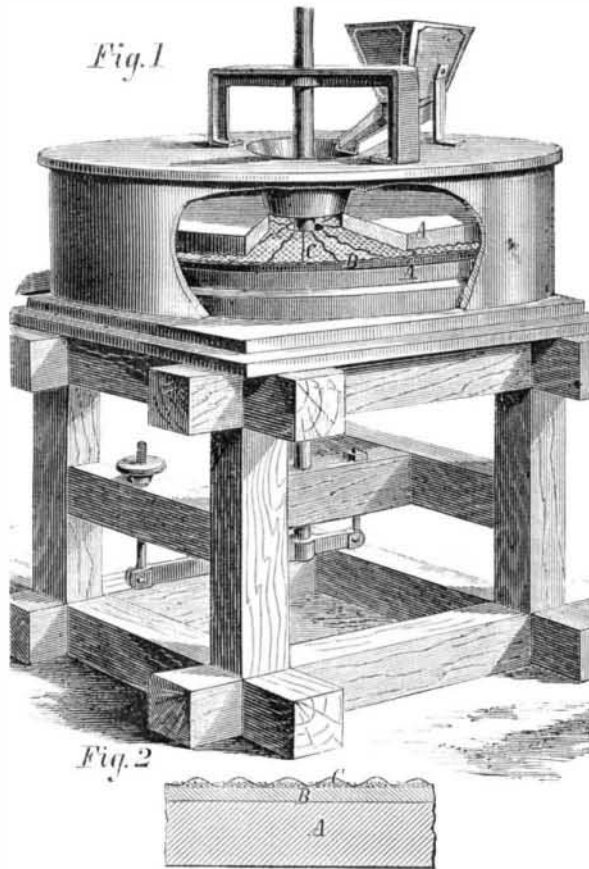


## COFFEE HULLING AND POLISHING MACHINE.

We this week put before our readers a further invention by Mr. José Guardiola, of Chocóla, Guatemala. It consists in a machine for hulling and polishing coffee, rice, etc., and its principal feature is an improved construction of the polishing faces of the rotary stones or other articles between which the coffee, etc., is placed to be operated on.



It will be seen from Fig. 1, which represents the machine with part of the cover and one of the stones broken away to show the interior parts, that it is similar in construction to an ordinary grain mill. At A are the two polishing or hulling stones in blocks. The polisher, A, is shown also in Fig. 2 which is a detail section of the same.

B is a covering of india rubber applied to the polisher, and C is a wire cloth which is stretched over it. The darker lines seen on the face of A, in both figures, represent thicker wire, which forms lines of rounded projections diverging from the center so as to increase the roughness of the polishing surface.

Stones thus prepared are much better for the purpose than the rigid surfaces heretofore employed, with which the chief difficulty was to prevent the grains breaking while being subjected to the necessary degree of friction. The rounded surfaces of the wire facing are sufficiently hard to remove the pellicles and polish the surface of the grain operated on; but by means of the elastic cushion, B, they yield enough to prevent all injury to the grain.

Instead of rubber, a cushion may be made of matting or other elastic material. It may, in some cases, only be necessary to have one of the stones prepared as described, and the face of the other may be roughened or grooved in the usual manner.

Patented through the Scientific American Patent Agency, July 30, 1872. For further information address José Guardiola, care of Ribon & Muñoz, 63 Pine street, New York, or care of J. C. Merrill & Co., 204 California street, San Francisco, Cal.

## Rock Ice that never Melts.

The following yarn, which will do very well for a hot weather romance, is produced by a Tennessee paper, and is supposed to refer to Linden, Perry county, in that State:

"Some ten days since, T. M. Brasher, our late representative from this county, Major J. L. Webb, our excellent sheriff, and J. P. Wilson, our efficient tax collector, were together at Major Webb's, and for recreation took a walk in and around his farm, when coming to the hills on the south of Major Webb's place, they approached the mouth of a cave in the side of a hill, from which, in wet weather, a stream of water usually flowed. Feeling very warm, they concluded to enter the cave to cool off a little, and upon entering were surprised at the unusual coldness that pervaded the cavern.

"Thinking there must be something in the dark recesses of the cavern to produce such unusual coldness in the atmosphere, they concluded to penetrate still further to see if they could not clear up the mystery. Procuring lights, they entered the cave and, after proceeding some seventy-five feet, upon turning an angle they beheld, to their astonishment, the whole interior of the cave festooned with the most beautiful stalagmites the eye of man ever beheld. Holding up their lights, they gazed upon the beautiful sight with pleased astonishment, and upon a nearer approach they found the stalagmites to resemble the hardest, clearest ice, and cold as the touch of the Ice King himself. Becoming by this time chilled through with the coldness of the place, each of the gentlemen broke

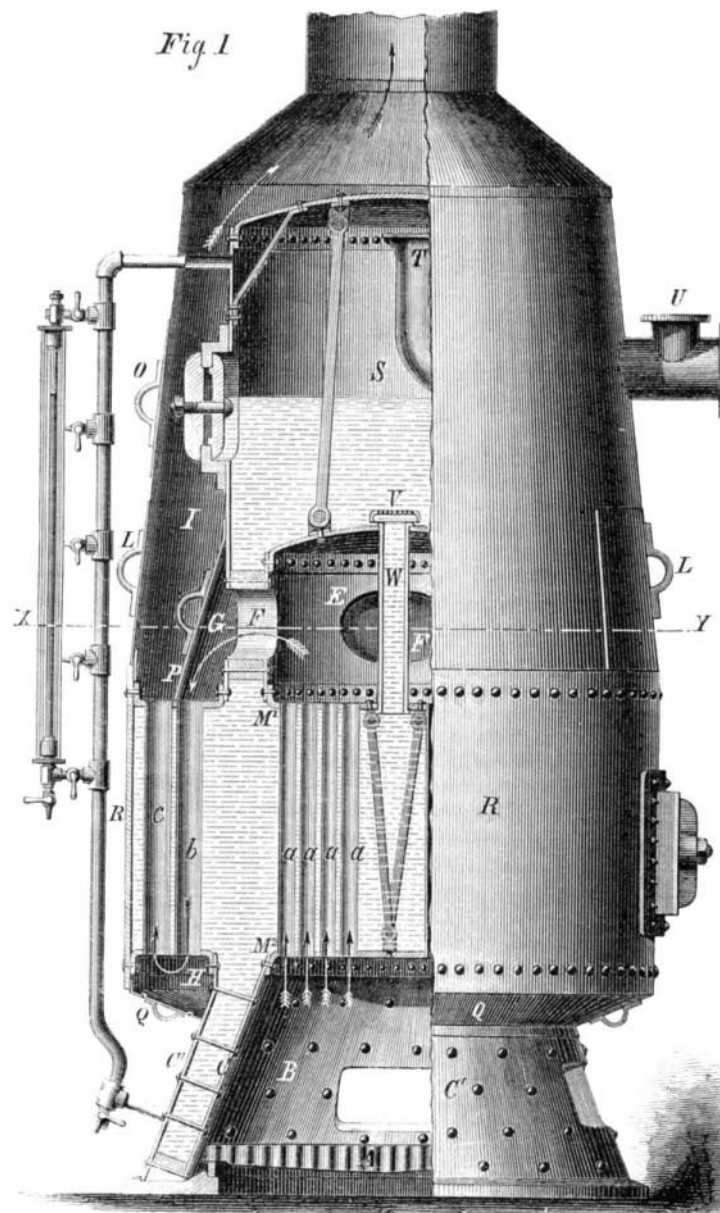
off a lump of this strange wonder, and started to return. Before reaching the mouth of the cavern, their hands were so chilled they could scarcely hold the strange substance, and upon reaching the outer air they laid it down upon the ground, thinking it would soon acquire the temperature of the atmosphere. Arriving at the house, they placed the crystals on a table and waited patiently to see if it would melt or even turn warmer. After waiting some half hour and finding that it still retained its former coldness, one of the party suggested that they should try it in a pitcher of water, which was soon declared equal to the best ice water. At dinner they tried it in milk, and it soon made Mrs. Webb's excellent buttermilk as cold almost as ice itself. It produced the same effect upon butter as ice, and still retained its original frigid-ity. A number of persons have since visited this wonderful cave and carried off portions of this rock, which they are using for all the purposes of ice, and it sustains no diminution in bulk or loss in coldness. Strange and improbable as all this may seem, it can be certified to by numbers of our best citizens. Dr. Black is using it in his practice. Mr. Thomas French and Colonel Waggoner, hotel keepers in Linden, used it in their hotels during court week, to the astonishment of their guests. Specimens will be sent to our State geologist for analysis."

## IMPROVED STEAM BOILER.

The improved steam boiler represented in the accompanying engravings is designed with especial view to the utilization of every available portion of heat through large grate and steam surfaces, freedom from danger of accident, economy of fuel, and facility for repairs. Though at first appearance somewhat complex, its interior arrangement needs but a short examination to render the manner, in which the inventor claims to have secured the above mentioned desiderata, easily comprehended.

The boiler is of the upright tubular type, embracing the special improvements hereafter described. Its chief peculiarity lies in an enlargement or belt around the waist or middle portion, which is inclosed with, and forms a part of, the boiler shell, and which, in combination with the provision for returning gases, contributes greatly to the efficiency of the invention.

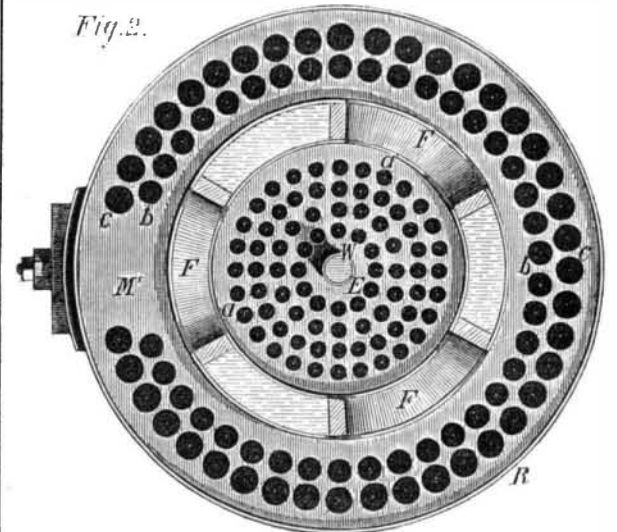
Fig. 1 is a side elevation showing, on the right hand, the outside of the casing, and on the left, the same broken away, presenting a perpendicular section of the interior arrangements. Fig. 2 is a horizontal section of the boiler through X Y. In Fig. 1, A is the grate, B the fire chamber, and C and C' the surrounding interior and exterior shells. The



products of combustion following the direction of the arrows in the engraving, arising from B, first pass through the fire tubes, a a a, into the mixing chamber, E. From this receptacle, the gases have their exit through the large openings, F F F, and after having imparted a portion of their heat in the ordinary manner, are retained by the conical casing, P, which incloses the space, G. They are consequent-

ly compelled to descend through the fire tubes, b, into an annular chamber, H, which is inclosed in a conical casing, Q. Thence the gases rise through the exterior circle of fire tubes, c, pass into the large space, I, and finally are discharged through the chimney at the apex, the object of forcing them through this circuitous course being to gain the full benefit of every particle of heat. The particular enlargement above referred to consists of the space between the annular tube sheets, M, M<sub>2</sub>, and the outer casing, R, in which are the circles of tubes, b and c.

A special point of advantage to which attention is directed, is the arrangement of the water spaces. A central chamber, W, will be noticed, extending above the crown sheets as far as the mixing chamber, E. At this point, it is reduced in size to a tube, W, which terminates at the bottom of the steam drum, S—its open upper end being surrounded by a perforated cover, V, which prevents a too violent upward motion of the current generated in the lower chamber. In connection with the other water spaces which lie between the systems of tubes, surround the fire chamber, occupy the interior of the



surrounding casings of the mixing chamber, and finally cover the lower portion of the steam drum, this central chamber adds greatly to the already large separating surface, so that steam may be rapidly disengaged without carrying up water into the steam pipes.

For easy access to all parts of this boiler, for repairs, ample provision has been made. By removing the covering at Q, the tubes, b and c, may be readily cleaned, the refuse falling out at H, by its own weight. The opening of the door at L permits entrance to the space, I, after which, the door, P, being displaced, access may be had to the chamber, G. Through the opening, O, the interior of the steam drum may be reached. At U is the steam pipe, its inner end, T, opening upwards in order to prevent its becoming obstructed through priming of the boiler. To the left of the illustration is the appliance for the test cocks and glass water gage, which, it is claimed, prevents these appendages from being choked or otherwise rendered inoperative. Its form is plainly shown and needs no special explanation.

The efficiency of this boiler has been amply tested, and, judging from the testimonials before us, with uniformly successful results. Steam, it is stated, has been obtained in the larger boilers in thirty minutes, and in the smaller ones in eighteen minutes—a fact due both to the large steam surface before described and to the liberal size of the grate, which, it will be noticed, is of much larger area than could be afforded if the lower portion of the boiler were made on a cylindrical instead of on a conical form. As regards economy, its consumption of fuel is claimed not to exceed two and a half pounds of coal per horse power per hour.

From the interior arrangement of this boiler, its safety from danger of explosion will be apparent to every mechanic. Ample steam space is afforded, which may be increased by making the steam drum of any required height. The outside covering forms a jacket which confines the heated gases around the interior steam generator, so that every available portion of heat contained in the escaping gases is utilized. In proof of how thoroughly this is done, it is stated that the exterior shell never becomes sufficiently heated to blister the paint with which it is coated; and we are informed of a case where a thirty horse power boiler has been used for two years and a half, and yet no deterioration of its outside paint-work is visible.

This invention is now in use in the Metacomet Mills of Fall River, Mass., in the Valley Worsted Mills, in Providence, R. I., on board the steamboat Plymouth Rock, and in many large manufactories throughout the country. Letters for further information should be addressed to the inventor, Mr. Daniel Flynn, Fall River Iron Works, Fall River, Mass. The patent bears date Nov. 15, 1870.

NICKEL PLATING BY THE BATTERY.—Professor Böttger mentions a curious fact that patents have recently been taken out for nickel plating by a process discovered and published by him thirty years ago. He reprints his own article on that subject, published as early as 1843, in Erdmann's *Journal für prakt. Chemie*, vol. 30, page 267.