extend their system so as to reduce the supply to tenants. They propose to build additional depots in the manufacturing districts as soon as they have practically demonstrated the feasibility of their plans. The erection of the works have been retarded by the freight blockade, which detained a quantity of machinery, but if nothing unforeseen occurs an experimental test will be made next month. Pipe laying will be begun this fall, and if the winter is favorable gas will be let into the system of tubes early in the spring. Applications for supplies are already in excess of the capacity of the company to meet.

Cellars as Centers of Malaria.

Dr. C. R. Agnew, writing from Florida, says: In this State a somewhat new problem presents itself, in the fact that all houses should be constructed without cellars, and so raised on underpinning as to allow a clean sweep of light and air beneath them. Indeed it is a question whether such a mode of construction should not be adopted everywhere for dwellings. I have for more than twenty years believed that cellar atmosphere is a most prolific cause of disease and death. I believe that it increases seventy-five per centum the risk from malarial disease all over our country. Through this State the native population, as by an instinct, raise their simple cabins three or four feet above the ground, and allow air and light to pervade the space so made beneath the ground floor. I advise all travelers to avoid those hotels and other domiciles in the South which are not so constructed.

Blue Milk.

The blue appearance which milk sometimes presents after standing a few days is due to an organism which is allied to bacteria, and can be transplanted into other samples of milk and various solutions. It thrives according to the proportion of acid present and the condition of the casein; it appears after a certain degree of acidification has taken place, and prevents the further formation of acid. The casein must also be unchanged; it is then held in solution during the bluing process. The bluing occurs only in presence of oxygen, and is attended with evolution of carbonic anhydride.—*F. Neelson, in Bied. Centr.*

IMPROVED UNIVERSAL CHUCK.

In general construction the chuck shown in the engraving resembles the universal screw chuck, the jaws being moved

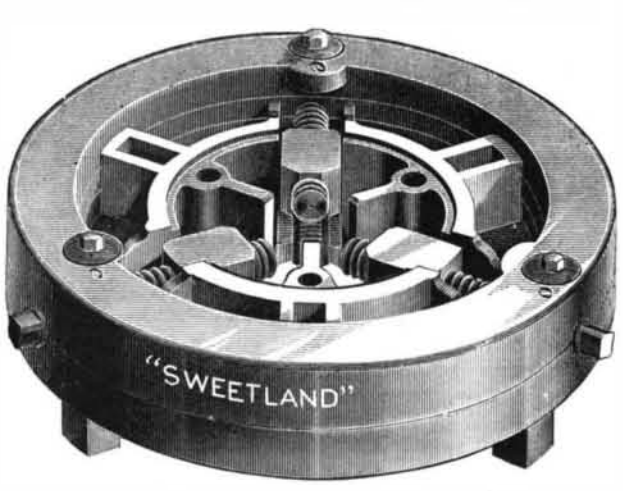


Fig. 1.—THE SWEETLAND CHUCK—BACK VIEW.

to and from the center, universally, by means of geared screws connected with the circular rack which revolves in a recess in the back plate. The front and back plates are bolted together, thus incasing and protecting the gearing.

The design of the improvement is to make the chuck independent as well as universal, and reference to the accompanying engravings illustrates the means employed to attain this object.

Fig. 1 represents the entire mechanism of the Sweetland chuck, showing plainly the circular rack and pinion screws connected at *o* and disconnected at *c*. The recess in back plate is made deep enough to disconnect the gearing. In the recess, and underneath the rack, lie the cam blocks, beveled to correspond with the continuous bevel recess in the back of rack, as shown in Fig. 2.

These bevel cam blocks have radial motion, and when moved to the outer portion of the recess and rack they connect the gearing, making the chuck universal; and when they are moved inward, allow the rack to disengage from the pinion, thus making each screw independent.

The cam blocks are held in place by the convex spring washers, *o*, *e*, *c*, which allow them to slide to or from the center without disturbing the nuts, the friction being sufficient to hold them in place.

The jaws have a long bite on the inner end, are strong in the nut, which has a full thread, and can be taken out of the chuck, for the purpose of cleaning, without removing it from the lathe. They are ground perfectly true on face and bite, also outer end, after being case-hardened.

There are lines on face designed as a guide for setting the jaws true. For instance, the chuck having been used independent, the operator wishes to use it as universal, the jaws would be moved inwardly, so that the outer end would be perfectly even with the line on face; now engage the rack into gear with the pinions by sliding the spring washers outward, and the chuck is ready for universal work, and perfectly true. This chuck has a large hole in center, and will allow a drill or reamer to pass through work without injury.

The No. 1, or reverse jaw chuck, is used for holding drills, screws, pipes, etc., and is very convenient for this class of work, also for hand tool work, brass finishing, etc.

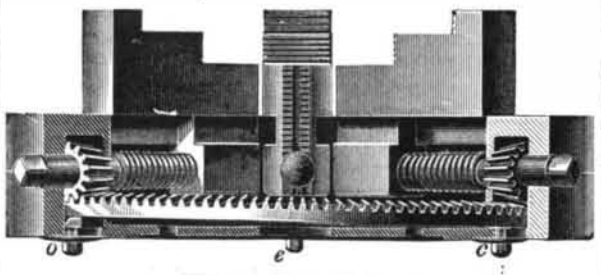


Fig. 2.—COMMON JAW.

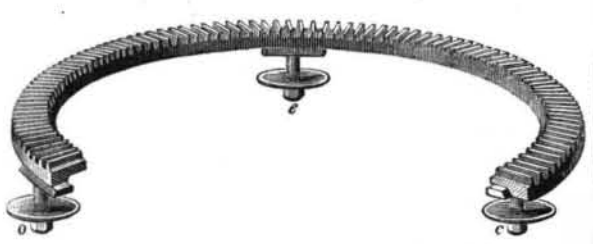


Fig. 3.—CIRCULAR RACK.

These chucks are furnished without the combination when desired, when they will be universal only. These chucks are made by Sweetland & Co., New Haven, Conn.

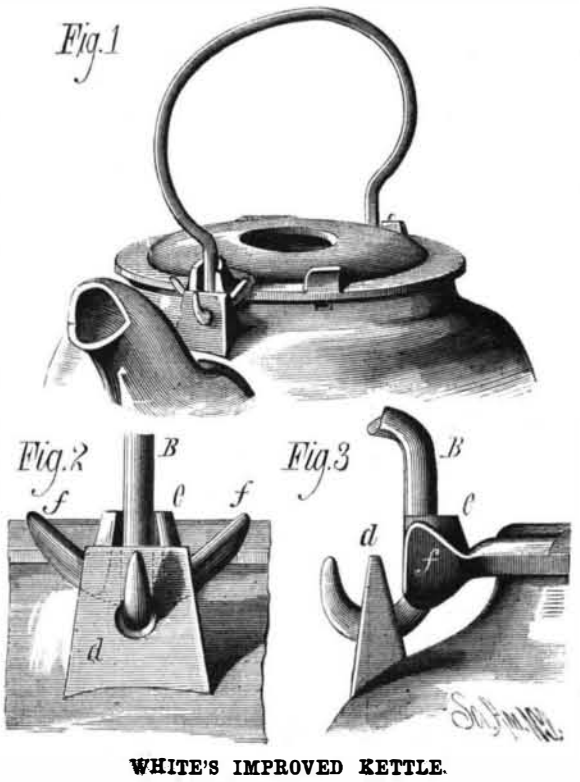
Good Living Easily Got.

In a recent communication to the San Francisco *Bulletin*, Mr. J. B. Rumford, of Bakersfield, Kern county, Cal., asserts that a man can earn enough there by fifteen days of "ordinary labor" to keep him in the best of food for a year. He says: "I find that three of us, a growing boy of seventeen years, my wife, and self, do not together use on an average more than one and one-half pounds of wheat or other grain per day, and though supplied with Seckel, Winter Nellis, and other pears, peaches, apples, Muscat grapes, and other fruit —not more than eight pounds of fruit per day—thus making a total expense of 2¼ cents for grain and 16 cents for fruit per day. So we have a total of 18¼ cents per day, or $66.60 per year, or $22.20 for each person; and as wages here for ordinary work are $1.50 per day (if you board yourself), it would take less than fifteen days' labor to provision each one a year on a full supply of the best grain and choicest fruits, giving the best health and gustatory pleasure; and as in the experiment we used them all uncooked, the only work of preparation necessary to be performed was a few minutes' time each day preparing the grain in a steel hand-mill, not equal to more than five minutes for each person."

Living in this way all the family gained in health. Mr. Rumford adds: "I was, in two weeks, completely cured of dyspepsia, that has troubled me from boyhood until nearly fifty years of age, and my spectacles, which had become constant companions, were nearly put aside, and with them all an increase of mental if not of physical ability. Any one, from one acre well cultivated in fruits and grain, with one hour's work each day, can be supplied with a most wholesome and delightful diet of the finest fruits and continue in good health; and one hour more, well applied, will furnish good comfortable clothing. Why need it longer be said man is subject to the curse of earning his bread by the sweat of his brow?"

IMPROVEMENT IN KETTLES.

The annexed engraving shows an improvement in kettles recently patented by Mr. L. A. White, of Attleborough, Mass. The design of the improvement is to keep the bail cool by holding it out of contact with the body of the vessel.



WHITE'S IMPROVED KETTLE.

To accomplish this the bail is hinged in the lugs, *d*, and at some distance from the hinge is bent outward in the usual way.

A latch or fork, *e*, is attached to the lid, and surrounding the lower end of the bail and holding it so as to retain the vertical position. The latch, *e*, is provided with two wings, *f f*, one on each side of the latch. When the bail is raised it will come in contact with these wings and raise the cover sufficiently to allow the bent portion of the bail to pass under the wings and enter the latch, *e*, when the cover will again descend and hold the bail in the vertical position.

A Bad Case of Globus.

Dr. Myers, of Paterson, N. J., was recently summoned in great haste, at midnight, to see a woman who was suffering the most excruciating agonies from having swallowed a set of false upper teeth, sixteen in number. Several women were about her, who had been called in to help her. Anodynes were administered to relieve her temporarily. Dr. Myers then closely scrutinized her mouth and throat, but could find no evidence of laceration. Moreover she could swallow readily. He suggested that the teeth might have been mislaid, but this was indignantly scouted by the attendants, who declared that they had searched the house from top to bottom.

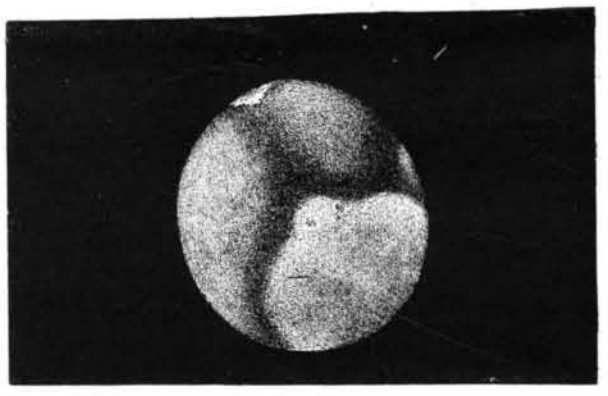
A further search under the pillow failed to disclose the missing property, and the case began to look serious, as the poor woman declared that she could not stand it any longer, as she felt the edge of the teeth cutting into the sides of her stomach. Finally, at the suggestion of the doctor, the inside of one of the pillow-cases was examined, and there the teeth were found, perfectly safe and harmless.

The patient, who had, a moment before, been suffering from the laceration of the teeth "against the edges of her stomach," recovered instantly, and the doctor was promptly dismissed.—*Medical Record.*

On the Probable Existence of Ocean Currents on Mars.

BY T. S. H. SHEARMEN.

The polar regions of Mars, like those of the earth, appear to be covered with a deposit of ice or snow. But there is a remarkable feature about the snow regions of Mars that has always puzzled astronomers. It is this: Their edges, instead of fading gradually as they should do if they melted by the direct action of the sun's rays alone, change in a very sudden manner from snowy whiteness to an umbral blackness. The annexed sketch, taken many years ago, and when Mars was in a gibbous state, shows this appearance.



The planet Mars in its gibbous state, as seen on August 16, 1880, in the twenty-foot reflector at Slough, by Sir J. F. W. Herschel.

How shall we explain the absence of penumbræ to the Martial snow regions? After a thorough investigation, I venture to enunciate the theory that the phenomena mentioned are caused by the action of warm ocean currents, like our Gulf Stream, flowing from the equatorial regions of the planet. To my mind, no other rational explanation seems to offer.

Brantford, Canada.

Fireproof Paper and Printing.

BY L. FROBEEN, BERLIN.

Paper that is actually fireproof, *i. e.*, such as can endure a temperature of 800° C. (1,472° Fah.) in combination with writing ink or printer's ink, which would endure so high a temperature without being injured, has not yet been made. Some kinds of paper made with asbestos did, indeed, resist a temperature not too high, but it was not suitable for writing or printing. According to the German *Industrie Zeitung* a method has been invented for making paper, etc., having these fireproof properties.

Asbestos fiber of the best quality is washed in a solution of permanganate of potash and then bleached with sulphurous acid. Five parts of ground or finely divided wood fiber, such as is used for paper making, is mixed with ninety-five of the asbestos. The two are then mixed with glue water and borax in a Hollander, where they are very intimately mixed and worked over into a paper pulp, which yields a fine paper with smooth surface, and can be calendered for writing. It is claimed for this paper that it will resist a white heat.

For making a fireproof printing and writing ink a mixture of platinum chloride and oil of lavender is employed. Lampblack and varnish are added to give it a black color or for a writing ink the Chinese or India ink and gum arabic are added. Good results are obtained by the use of ten parts

© 1882 SCIENTIFIC AMERICAN, INC