

SCIENTIFIC AND PRACTICAL INFORMATION.

ARTIFICIAL TEETH ON NATURAL STUMPS.

Mr. Moon has recently stated, in a communication to the English Odontological Society, that the stump of a tooth may be preserved as the basis of an artificial tooth, and rendered painless, by leaving the root canal empty and drilling a hole into it just below the edge of the gum. This hole becomes a permanent vent and thus saves the stump from disturbing influences, which, if deprived of means of escape, would ultimately destroy it by a painful process.

LIFTING EFFECT OF FROST ON TREES.

Dr. Lapham, State Botanist and State Geologist of Wisconsin, says that frost exerts a lifting power on full grown trees, so as to cause the impression on some that the tree begins to grow again after once attaining its full growth. When the land freezes expansion ensues, drawing the tree up with it, leaving of course a cavity whence the root was drawn. When the first frost comes, the moisture, carrying earthy matter, enters the cavity, and thus the root is prevented from returning to its original position. Dr. Lapham suggests that one of the chief offices of the tap roots may be to guard the tree as much as possible against this frost-lifting.

AMERICAN MEAT SOLD IN ENGLAND.

Quite a large quantity of American meat was recently sold in the Liverpool markets at paying prices. It was taken over by the steamer Illinois, in a large tank surrounded by ice and cooled by air driven in by a steam-worked blower.

BEEF CIDER.

We mentioned not long ago that a cider made from beets was coming into use in France. We learn that it is prepared by adding 7 lbs. of red garden beet to every 2½ bushels of apples, pressing all together. The cider must not be used for about eight months, when it will be free from the beet flavor.

TO OBTAIN A BROWN PATINA ON ZINC.

A solution of molybdic acid, or molybdate of ammonia, in very dilute aqua regia, or a solution of molybdic acid in excess of very dilute caustic soda, produces, according to Kletzensky, a very useful patina bath for articles of cast zinc. Zinc statues or other ornamental articles, when dipped into this bath, become covered with a very pleasing brown patina showing the prismatic colors. This covering is nothing but a thin film of oxide of molybdenum, which exhibits polarization colors and adheres firmly to the metallic zinc.

EXPLOSION OF CHROMIC ACID WITH GLYCERIN.

Explosive prescriptions are sometimes sent to innocent pharmacists by careless or ignorant physicians. The latest case of this kind is related by Austrian journals. The following mixture was ordered for external use: 7.5 grains chromic acid and 60 grains glycerin. The chromic acid was mixed with water in a flask and the glycerin mixed with it by shaking. Suddenly the contents of the flask exploded with a loud report, flying all about the shop, while the vessel remained unhurt in the hand of the astonished apothecary, and was covered with a black mass. This case deserves the more notice because the quantity was so small and the detonation so extremely violent.

Economy in Machine Shops.

The following suggestions, in regard to the care of tools and waste of oil in machine shops, are contained in a paper read before the New York Society of Practical Engineering, by James C. Bayles, editor of the *Iron Age*:

"The proper care of tools is always attended with an important economy. In small establishments this seldom receives due attention. As a rule, a tool belongs to anybody who happens to have it; consequently, no one is responsible for it. It is neglected, abused, mislaid, broken, stolen, or worn out before it has rendered half the service it is capable of performing. In some shops the time of one man, and sometimes two, is constantly lost in looking for missing tools and putting them in order for use when found; and a great deal of capital is wasted by the premature destruction of tools which, with proper care, should have lasted for years. In all manufactories there should be a place for tools not in constant use, and some one should have charge of them. A very good system, which I have always found to work well, provides for the charging of every tool in use to the man using it. When it is returned he receives a credit for it which balances his account with the tool department. For tools added to his individual kit, such as files and other implements supplied by employers, charge is made and no credit is given until the tool is returned broken or worn out, when a credit entry is made, with date, showing how long it has been in use. Such a record induces men to be careful of tools, and, by inculcating good habits in this respect, leads to economy in a direction in which waste and extravagance are easily overlooked.

"Another important saving in many shops would attend a more judicious oversight of the consumption of oil. In machine shops, and to a greater or less extent in all shops where machinery is used and iron worked, the amount of oil wasted constitutes a very large proportion of the total amount used. This waste results from a certain looseness of habit which most men acquire in handling materials which some one else pays for. When a drop of oil is needed, it is customary for the mechanic to pour a stream from his oil can, and wipe off the surplus with a wad of cotton waste. It is no exaggeration to say that half the oil used about many manufactories of machinery and metal goods is wasted, and the waste constitutes a serious item of expense. Oil is almost always used exclusively for lubricating purposes, es-

pecially in small establishments, yet there are other lubricants that might be kept constantly on hand, which are at once much cheaper and much better than oil, for such purposes as drilling, tapping, screw cutting, etc. There is also a great deal of oil wasted in applying it to machinery and shafting. Whenever we see a drip pan that has not been attended to for a few days, we may be pretty sure of finding it half full of oil which has rendered no service, and which has become unfit for use, being gummy, foul, and filled with foreign impurities. There is no need of this waste, which never occurs when the oiling of the shafting and machinery is properly looked after; but it is an evil against which the manufacturer can guard only by constant watchfulness."

THE PATENTS OF 1875.

(FROM THE FORTHCOMING ANNUAL REPORT OF THE COMMISSIONER OF PATENTS.)

Number of Patents issued by the United States Patent Office to Residents of the different States, Territories, and Foreign Countries, from Jan. 1, 1875, to Dec. 31, 1875.

(The proportion of patents to population is shown in last column.)

States, etc.	No. of Patents.	One to every	States, etc.	No. of Patents.	One to every
District of Columbia	214	615	Nebraska	22	5,833
Connecticut	706	761	Texas	118	6,939
Massachusetts	1,846	757	Louisiana	108	7,057
Rhode Island	229	943	West Virginia	48	9,209
Colorado Territory	36	1,107	Kentucky	132	9,303
New York	3,771	1,163	Montana Territory	4	9,974
California	399	1,404	Tennessee	117	10,765
New Jersey	656	1,534	Virginia	101	12,130
Pennsylvania	2,034	1,728	Washington Territory	3	12,710
Illinois	1,098	2,313	Idaho Territory	1	14,999
Ohio	1,891	2,443	South Carolina	46	17,513
New Hampshire	127	2,506	Georgia	68	18,796
Vermont	122	2,709	Utah Territory	5	19,916
Delaware	44	2,841	Mississippi	38	21,767
Michigan	405	2,923	Florida	7	26,821
Maryland	260	3,003	North Carolina	37	28,956
Minnesota	146	3,011	Alabama	31	32,161
Nevada	16	3,969	New Mexico Territory	3	37,101
Wisconsin	284	3,743	Arkansas	11	44,042
Iowa	315	3,780	U. S. Army	5	
Maine	158	3,964	U. S. Navy	1	
Indiana	378	4,462			
Oregon	32	4,631	Total for U. S.	15,698	2,414
Dakota Territory	3	4,727	To subjects of foreign governments	590	
Missouri	362	4,754	Aggregate	16,288	
Arizona	2	4,829			
Kansas	66	5,521			
Wyoming Territory	2	5,759			

RECAPITULATION.

Issued to citizens of—	
United States	15,698
Canada	150
Other subjects of Great Britain	221
France	91
Other foreign countries	128
Aggregate	16,288
Number issued in 1874	13,599
Increase over 1874	2,689

PATENTS EXPIRED.

Number of patents expired during the year 1875	579
Number of design patents expired during same time	782
Whole number of expirations	1,361
Less number of extensions granted	88
Leaving the actual number expired	1,313

SECTIONAL ANALYSIS.

An analysis of the table shows interesting facts. The geographical distribution of inventors, to whom patents were granted in 1875, appears by it to be as follows:

To the six New England States there were issued 3,188 patents, being one to every 1,094 people.

To the seven Middle States (including Delaware, Maryland, and West Virginia) 7,905, one to every 1,623 people.

To the nine Western States (including Missouri) 3,076, one to every 3,360 people.

To the twelve Southern States, 814, one to every 13,279 people.

To the three Pacific States, 437, one to every 1,699 people.

To nine Territories, 59, one to every 12,203 people.

And to the District of Columbia, 214, one to every 615 of population, being the highest ratio in the Union.

GAINS AND LOSSES.

All the States and Territories have held their own, or made gains over 1874 in the number of their patents, save the following, which show losses: Alabama, Arkansas, Florida, Georgia, Kansas, Mississippi, Nebraska, Oregon, Vermont (for a wonder), and Dakota, Utah, Washington, and Wyoming Territories.

New Hampshire and Nevada remained stationary, the former having 127, the latter 16 patents, the same as in 1874.

The principal increase was made in the following States: New York, 986; Pennsylvania, 390; Massachusetts, 340; Illinois, 164; California, 98; and the District of Columbia, 69.

Useful Recipes for the Shop, the Household, and the Farm.

A great many directions have been published for mending india rubber boots and shoes, most of which were worthless. The following can be relied on: Procure a small tin box of prepared rubber in a semi-liquid condition, which can be purchased for a few cents at almost any store where india rubber goods are kept for sale. The boot must be washed clean and dried. Then the surface around the rent is to be roughened a little with the point of a knife, after which the semi-liquid rubber is spread on with a spoon as thickly as it could be without flowing away. Then a neat patch is prepared and covered with one or two coats of rubber. When the prepared rubber is almost dry, the patch is applied and held on firmly for a few minutes.

It frequently happens that chemists and others desire to utilize pieces of broken glass apparatus by cutting the same into forms. The following is a simple method of this. Make a paste of ¼ oz. gum tragacanth with water, and also ½ oz. powdered gum benzoin with alcohol. Mix the two compositions, and add powdered beech wood charcoal, forming a thick dough, which mould into little sticks about 4 inches in length and ¼ inch thick. The glass to be cut is first scratched deeply with a diamond, and then one of the sticks, previously ignited, is held against the crack. The glass will

divide neatly as the end of the stick, which becomes a pointed glowing coal, is drawn over the diamond scratch.

S. A. T. says: To stick leather, paper, or wood to metal, to a gill of glue dissolved in water add a tablespoonful of glycerin.

The best treatment for slight burns is to apply cotton batting soaked with a liniment made of equal parts of linseed oil and lime water. Be careful not to break the blisters, should any form.

The finest quality of indigo has the least specific gravity, and floats upon water. It may also be tested by its not readily leaving a mark on drawing it across a piece of paper, and also by the clear blue which it imparts to water when dissolved.

To prevent the skin discoloring after a bruise, take a little dry starch or arrowroot, merely moisten it with cold water, and place it on the injured part. This is best done immediately, so as to prevent the action of the air upon the skin. Invaluable for black eyes.

Excellent toy balloons can be made out of turkey's crops, in the following manner: Free the crop from the thick coating of fat, turn the inside out, and cleanse. Soak in water for two days, and then, with a blunt knife, scrape off the internal coating. Wash the crop well, and dry. Turn it right side out again, and make an incision through the external coats, carefully avoiding cutting the lining membrane. Draw the coats at one side over one neck of the crop, and tie the latter firmly with silk. Proceed at the other neck in the same way. Distend the bag thus formed with air, and hang it up to dry. A light coat of varnish may be added afterwards. Thus prepared, an ordinary crop will hold a gallon of gas and will weigh only 30 grains, which is considerably less than the weight of a bladder of similar capacity.

When a teaspoonful of any medicine is prescribed by a physician, it should be borne in mind that the quantity meant is equal in volume to 45 drops of pure water at 60° Fab. It is a good plan to measure off this amount in water in a small wine-glass, and mark on the latter the exact height of the fluid. This will give an accurate and convenient standard for future use. Teaspoons vary so much in size that there is a very wide margin of difference in their containing capacity. It is well to remember, also, that four teaspoonfuls equal one tablespoonful or half a fluid ounce. A wineglassful means four tablespoonfuls, or two fluid ounces; and a teacupful, as directed by cookery books, indicates four fluid ounces or one gill.

A good dentifrice, largely sold and advertised, is made of ¼ drachm white Castile soap, dissolved in 1 oz. alcohol, ½ oz. water, and ¼ oz. glycerin. This is colored with cochineal and flavored with peppermint, wintergreen, and clove oils. The powder which accompanies each bottle is a mixture of precipitated chalk, powdered orris root, and carbonate of magnesia.

To make a handy snow shovel, take a light, tough, half inch board, twenty inches long and a foot wide. Sharpen one end, and over it rivet a strip of thin sheet iron, bent sharp to fit the edge; this forms the cutting edge. Across the other end nail firmly a piece an inch thick, five inches wide, and long enough to extend across the shovel board. Bore an inch hole through this, slanting downward and forward, so that the handle when passed through the hole will strike the board three or four inches in front of the cross piece. Bevel the end of the handle to fit the shovel board, and fasten it with a staple. The handle should be long enough to work without stooping, and the whole thing should be as light as possible.

The easiest way to burn stumps is to use a sheet iron chimney, big enough in diameter to fit over the largest stump, and some six feet in height. An opening near the bottom answers for a door. The stump should be set on fire by placing around it some kindling wood inside the chimney, and the latter will produce a draft which will materially hasten the burning of the wood.

Black lead well mixed with white of egg is a good stove blacking. Lay on with a paint brush, and when dry polish with a hard brush.

To prevent flat irons from rusting, melt ¼ oz. camphor and ½ lb. fresh hog's lard over a slow fire, take off the scum, and mix as much black lead with the composition as will bring it to the color of iron. Spread this over the articles for which it is intended. Let it lie for 24 hours, and then rub it well with a dry linen cloth. Or smear the irons over with melted suet, and dust thereon some pounded unslaked lime from a muslin bag. Cover the irons with baize in a dry place when not in use.

A farmer correspondent sends us an excellent wrinkle for finding the weight of horses or steers without scales. He says: "Make a weighing stall about 3 feet wide with a level floor. In the latter make a recess for the platform of the scales so that the platform will be flush with the planking. Now lead your horse or steer into the stall so that the forefeet of the animal rest on the platform and note the weight. Start him ahead until his hind feet are on the platform; note the weight again. Add the two weights thus taken, and the sum will be the total weight of the animal."

Leather pump packing requiring to be very tight, for small work, should not be more than ¼ inch thick, and not be bent up round the bore or sides of the barrel more than ¼ inch.

The cause of streaked butter is the imperfect working of the butter after it is salted. Salt in butter sets the color, or deepens and brightens it; so that if the salt is worked into the butter and not so fully worked as to salt every part, then the fresh butter retains the color it had when it came from the churn, and the salt butter grows so much darker that it is decidedly streaked. The remedy is to work the streaked butter more thoroughly.