(27) G. W. I. writes: Please state the dif- smoke is very hard to get rid of, there being so much of ference of draught of two cars of same dimensions and it. 1 used oil of vitriol, supposing it to be sulphuric forty varieties of peas and beans are cultivated. The weight, one running on a two foot gauge track and the acid. Will you please advise me as to what the trouble richly nutritive soy bean properly supplements the rice, other on a four foot gauge? A. On four foot gaugeas the running gear will be heavier and the friction greater-with same size of wheels.

(28) W. P. T. writes: We have four boilers, 20 feet long and 48 inches in diameter, set in a battery with steam drum, carrying 80 pounds steam. We have two engines coupled together on one shaft and supplied with one steam pipe and one governor. The steam pipe branches, after passing the governor, one branch running to each engine of course. The engine cylinders are each 16 inches in diameter and have 20 inch stroke of piston. The governor is the same distance from each engine, i. e., 3 feet, but is 53 feet from the governor to the steam drum, with two square turns between the governor and steam drum. The engines have common slide valves, and run 160 revolutions per minute. The steam feed pipe 18 5 inches in diameter and governor is a 5 inch one, made by Allen Governor Company. Now the question is: Is the feed pipe large enough to supply the engines fully in hard labor, or do we lose power in putting the steam through so small a steam pipe? And how large should the steam pipe be to get the best result? A. If you use a cut-off on your engines, the pipe is large enough. If you work whole stroke, it would be necessary to apply an indicator to determine whether the pipe is too small. Your loss of power, if any, must be small.

(29) J. H. R. asks (1) how far apart steam pipes 21/4 inches in diameter should be from outside to MENT No. 317) can be moulded when moist into various outside in order to obtain the best results from the fire (soft coal). A. You do not state whether the fire is outside or inside the tubes. If outside, they can be placed at such a distance as necessary for draught, and this will depend upon arrangement of flues. If inside, not less than ¾ inch, and would be better if ¾ or 1 inch. 2. How much higher should the end of a twelve foot pipe be at one end than at the other to allow the steam to escape freely? A. A rise of one inch to the foot will ing-probably not. answer well. But more would be better if there is intense fire. 3. At which end of the pipes should the fire be placed, the highest or the lower end, to get the best effect of the fire? A. Lowest end. 4. What is the greatest pressure it would be sate to carry steam in lapwelded boiler tubes, 2½ inches outside diameter, tube weighing 234 pounds to the foot? A. 200 to 250 pounds per square inch. 5. How many pounds is about the greatest strain threads will bear in Seller's system of screw threads and nuts? A. The strength of the thread is intended to equal that of the bolt, if the nut fits well and is equal in thickness to the diameter of the bolt.

(30) J. C. L. asks: Do you know of any material or substance that is perfectly transparent (similar to glass) yet impervious or so reflective of the sun's rays as to prevent its usual fading effect on a delicate alkaline color? A. We know of no such substance

(31) C. J. asks: Which would afford the greatest amount of power at the same pressure of steam. say 60 lb. to square mch, two engines, 31/2 by 8 mch stroke, both connected to one shaft, or one engine 7 by 8 inch, to work from same shaft? What would be the difference in the power and also in fuel? The boiler is 54 inches long by 32 inches diameter; 34 two inch tubes; locomotive type. A. The 7 inch cylinder by 8 inch stroke would give double the power (with same pressure and speed) that would be given by two cylinders 31/2 by 8 inch, stroke, and with slightly greater economy of

(32) J. L. writes: I should like a receipt for a cement that will do for kerosene lamps. Can you give me a receipt through your columns? I have tried plaster of Paris and various other things, but without success. A. Plaster of Paris made into a paste with a sirupy solution (aqueous) of water glass, and used immediately, makes a very good cement for containing films of mica and a small quantity of iron this purpose. Hot soft soap is used in connection with sulphide—of no value.—T. B. H.—The liquid will replaster in a similar manner for this purpose. See " Cements," page 2510, SUPPLEMENT No. 158.

(33) W. G. B. asks: Will you kindly tell me how to make the common liquid ammonia and alcohol of commerce; also camphor in small quantities? A. Dissolve about 10 pounds of sugar in 5 gallons of water; add a little yeast, and set aside in an open vessel in a, cool place to ferment. As soon as the fermentation subsides put the liquid in a retort and apply heat. When the liquid begins to boil attach a coil of small copper pipe so as to receive the steam or vapor, and immerse this coil in a tub of cold water so that the vapors will be condensed within it, and drip out the lower end into a receiver. The spirit thus obtained will contain much alcohol. It is rectified by careful redistillation, and called alcohol. To make liquid ammonia mix 10 pounds powdered sal-ammoniac with about 6 pounds pure lime (previously dry slaked); put this mixture into an iron retort, and apply a moderate heat. Pass the ammonia gas given off through a series of bottles half filled with cold water; the water will absorb the gas, and when enough of the gas has thus been absorbed the water in the bottles becomes aqua ammonia (ammonia water). practically demonstrated that a well fed, capable, pro-Consult Wagner's "Chemical Technology" and the United States Pharmacopœia.

is, and how I can improve the light? A. The apparatus ' which plays so large a part in the national diet. After 'B referred to is not designed to produce a very brilliant rice the cereals most cultivated are in order-barley, light. The faint blue flame, however, possesses sufficient millet, wheat, rye, and Indian corn. The sweet potato actinic power to make it, in some cases, serviceable for takes the first place among tubers, the annual product photographic purposes. A glass chimney can be made being sixteen million bushels. This crop is rivaled by to confine and conduct the smoke to a flue. The greater that of the large white and highly odorous radish known portion of the products of combustion are readily ab-tas "daikou." Carrots, turnips, parsnips, and the like sorbable in moist slaked lime. Common sulphuric acid are very largely eaten. The entire list of food plants is commercially known as oil of vitriol.

(37) M. N. writes: I want to make a large slab of artificial marble. Can you inform me of a composition for such which will become as hard and strong as marble itself? A. Try the following: Reduce marble dust or white limestone to a very fine powder by granding and sifting, mix with it intimately about one fourth its weight of zinc oxide (zinc white) and oneeighth its weight of Portland cement, and mix thoroughly into a thick paste with a sufficient quantity of a hot aqueous solution of water-glass, containing about 40 per cent of the glass. Mould the paste under pressure while warm, and expose the moulded form for a week or ten days to warm dry air, before finishing. See Water-glass," page 16, vol. xlv.

(38) J. A. H. asks: 1. Can soapstone ground fine be moulded into different shapes by mixing with some ingredient, and hardened for bricking or ornamental purposes, such as mantels, table tops, etc. ? A. Soapstone powder mixed with water-glass (see SUPPLEforms, which, when dried, become quite hard and closely resemble the natural stone. This artificial stone does not, however, stand heat as well as the native rock. 2. From what quarries do the New York dealers procure their soapstone? A. Chiefly from Vermont and the Carolinas. For the other information you should address some dealer in soapstone. 3. Will the quarry widen as you go down? A. We have no means of judg-

(39) D. J. C. asks: Will you please state what are the proper ingredients and proportions and how to mix and apply them to brick work, to stain the latter to represent red brick? A. The color is clear red ocher or Indian red, and the vehicle a thirty-five or forty per cent aqueous solution of good soda water glass (see SUPPLEMENT, No. 317). The pigment and vehicle must be well ground together. It is preferably used hot.

(40) R. E. N. asks: How can I make oxygen to use with the appliance described in SUPPLEMENT No. 20, 1876, under the head of "Soldering." by George M. Hopkins? A. See page 5013, SUPPLEMENT, No. 314.

(41) D. L. asks: Will you kindly give me a receipt for making printer's composition rollers for power cylinder presses? A. An equal quantity of concentrated glycerine and good glue are weighed out; the glue is softened by soaking it over night in a little cold water, and then dissolved in the glycerine by aid of heat over a waterbath. The heating is continued for several hours to expel the water taken up by the glue in softening, and then poured into the oiled metal moulds. A small quantity resin soap is added to the composition by same makers, and sometimes part of the glycerine is substituted by molasses.

MINERALS. ETC.-Specimens have been received from the following correspondents, and examined, with the results stated:

A. A. St. J.-We cannot undertake to analyze the substance-it is a complex mixture of drugs and organic substances.-M. B.-The crystals are calcitebonate; the rock is dolorite trap.-F. F. & W. F.-1. Barium sulphate or heavy spar-used to some extent by paint manufacturers, 2. An impure quartzose sand quire an analysis. We cannot tell what it is composed of by an examination.-A. E. A.-It appears to be chiefly composed of cork dust, chalk, plaster of Paris, water glass, and cologne spirits.

NEW BOOKS AND PUBLICATIONS. THE FOOD OF THE JAPANESE PEOPLE. By Thomas B. Van Buren, U. S. Consul General of Japan. Yokohama. 1881.

Among the many reports returned to the State De partment at Washington by our consular agents abroad. this report on the food of the Japanese people is of exceptional interest. The subject has been investigated with a thoroughness which makes the report a scientific monograph of no mean order; and the subject itself has especial interest in its bearing on the question how far the characteristics of national life are determined by a people's food. It has happened that most if not all of the more forceful and active nations of the west have been large consumers of meat. So markedly has this been the case that it is commonly accented as a truth Artists' use, hoard or tablet for S J Freehner. 253092 Folding table, N. Jerolaman. 252,878 Folding table, N. Jerolaman. 252,879 Folding table, N. been the case that it is commonly accepted as a truth gressive people must of necessity consume a large proportion of animal food. It gives this theory something of a set-back to learn that the most progressive of oriental nations, the Yankees of the East, as they have been called, are almost exclusively eaters of vegetable cannot afford to eat it. Beef cattle are scarce, and mutton and pork still scarcer. Domestic poultry and wild fowl are so costly that even the well-to-do partake of them sparingly and only on special occasions. Fish are comparatively plentiful and are more largely eaten; so that it is estimated that half the people eat fish every day; one-quarter two or three times a week: the rest perhaps once or twice a month. Nevertheless the food of the masses is nine parts out of ten vegetable. Yet the Japanese are well fed, and though of small stature. are well developed physically, and capable of sustaining severe and long-continued mental and bodily labor. (36) C. A. C. writes: On page 208 of Their physical and intellectual superiority to the rice-Science Record for 1875 is a description of a new artifi. | eating Bengalese-so far as determined by the nature of cial light I have been to considerable expense in mak- their food--may perhaps be attributed in large measure

plants of the class known as leguminous. More than covers a dozen long columns. Most of them have no western equivalents, though many of them no doubt might be profitably introduced among us. The manner of preparing a number of the leading articles is given according to the practice of the chief cook of a native eating establishment. The value of the copy of the report transmitted to us by Mr. Van Buren has been greatly augmented by extension. It has been inter- Ca leaved with numerous photographic illustrations of C Japanese life, which give one, so to speak, an inside view of the industrial and social life of the agricultural peasantry, the artisan classes, the merchants, doctors, teachers, professional storytellers, and the rest. Among the characteristic features of these views of the Japanese at home, in the field, journeying or pleasure taking. C one cannot but notice the general expression of good humor upon the faces of the men, however ugly they Ce may seem to our western eyes; the amiability, sometimes real beauty, of the women folk; and the comfortable open-eyed serenity of the babies.

THE UNIVERSAL CALCULATOR, WITH DIREC TIONS FOR USING IT. By W. H. Wythe. Red Bank, N. J.

 ${\bf A}$ very simple and ingenious application of the principle of the slide rule to a circular chart of several scales with two movable arms. One arm is fixed to a central disk, against which the other arm bears with friction enough to cause it to be retained in any desired position relative to the first arm, while both arms are moved together around the concentric scales. By simple and obvious applications of the rules of proportion all arithmetical problems involving multiplication, division, even powers and roots, percentages, and so on-in short the vast majority of the problems that come before the artisan or the business man, can be quickly solved by an easy mechanical process. Any one who has much figuring to do would be likely to find it a very helpful time and labor saving instrument.

CAWKER'S AMERICAN FLOUR MILL DIREC-TORY FOR 1882. Milwaukee. Wis.

The intelligence and care with which Mr. Cawker's work is done was attested in the directory of flour mill owners prepared by him last year. This edition he considers an improvement on the last. It gives the Co names and post office addresses of all the flour mill owners in the United States and Canada. The total number of addresses approaches twenty-three thousand.

THE USE OF TOBACCO. By J. I. D. Hinds, Cr Ph.D. Lebanon, Tenn. Private print, Cr 16mo, cloth, pp. 38.

An exceptionally temperate discussion of the tobacco habit, historically, commercially, physiologically, and Di socially considered. The tone of the argument against р the use of tobacco is calm, and more than usually cogent in that it avoids extravagant assertion and rant. It is Dı good book to put into the hands of youth.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH

Letters Patent of the United States were Granted in the Week Ending

January 31, 1882,

AND EACH BEARING THAT DATE. [Those marked (r) are reissued patents.]

A printed copy of the specification and drawing of any patent in the annexed list, also of any patent issued since 1866, will be furnished from this office for 25 cents. F In ordering please state the number and date of the F patent desired and remit to Munn & Co., 261 Broadway, corner of Warren Street, New York city. We F also furnish copies of patents granted prior to 1866; Fi but at increased cost, as the specifications not being printed, must be copied by hand.

dvertising device, E. L. Morris...... 253,087

Alumina, manufacture of soluble, J. Webster 252,982

		<u> </u>
١		
ĥ	Box. See Blacking box. Miter box.	
İ	Bracelet, J. V. Diefenthaler	253,017
ł	Brake. See Car Brake. Railway brake.	
ľ	Brush. flue, J. N. Gibson	253,034
	Bung, E. F. Games	252,937
	Burglar alarm. S. D. Lake	253,070
	Burner. See Vapor burner.	
	Button fastening, G. W. Prentice	253,096
	Buttons, attaching, S. D. Jordan	252,880
	Can. See Fruit can. Oil can.	
	Can cap, C. W. Lyon.	253,075
	Can capping machine, J. Roberts.	253,104
	Cans, sealing, F. B. Ginn	253,036
	Cane, cigar case, pipe bowl, etc., combined, D.	
ì	Crowley	253,011
Ì	Car brake, G. W. Friel	253,031
	Car coupling, J. L. Griffin	253037
	Car coupling, C. L. Horack	253,050
	Car coupling S. A Perry	25:2.965
	Car motor, spring, W. T. Larimore	253 072
	Car running gear railway B C Wilson	259 018
	l'aristanter I. Holm	002,010
•	Car stock I & Buttorfold	250,014
	Cars at a superstus for montilating I Arkell	059140
•	Cars, etc., apparatus for ventilating, 5. Arken	203,149
•	Cars, pin and link carrying device for raiway, P.	050.000
1	McGuire.	252,890
j	Caraing machine rollers, tooth for cleaning, Ker-	~~~ >~~
	sbaw & Cunningham	253,065
	Carrier. See Package carrier.	
	caster, furniture, W. T. Kosinski	252,954
	Celluioid collars, machine for creasing, bending,	050 000
	and shaping, E. Cary	253,001
	Chain, ornamental, S. Davidson	253,013
	Chair back, Tonk & Howe	252,980
	Chaudelier hanger, G. W. Woodward	252,919
	Channels throughs and bars in harbors, construct-	
	ing, D. W. Williams	252,917
	Cheese vat, G. H. Simon	253,118
	Chuck for screwmachines, H. K. Jones	252,948
	Churn, F. P. Stebbins	253,122
	Churn dasher, R. S. Bridgman	252,995
	Cigar mould press, G. Vollkommer	253,135
	Clothes rack, W. H. McKenzie	253.081
	Clutch and brake for hoisting, etc., friction, D. H.	
	Merritt	253,083
	Clutch, friction, J. Smith	252,975
	Coal slack, apparatus for burning, C. Taylor,	252,910
	Cock. cylinder drain, J. B. Mooney	252,959
	Coffee roasting apparatus, H. Faulder	252,933
1	Coffer dam. H. P. Kirkham	253,067
ł	Condenser, T. Elcoate	252,932
į.	Conductors, laving subterranean, H. E. Loane	252.956
l	Converter plant, Bessemer, A. L. Holley	253.049
ļ	Cooking apparatus, steam J. H. Linney	252 884
	Cooling process of and apparetus for dunamic L.	~~~,00±
ł	Allon	959 091
ŀ	Corn hysking mechine F Ohmert	953 001
ŀ	Corn shellor Kissner & Onteelt	250,091
	Compies window C. B. Klingenberg	052,001
i,	Cornet () E Allon (n)	10 010
	Conset M E Field	10,019
ł	Corset. M. E. Flein	10.095
	Cotton at a machinery for opening or propering	10,0 \$5
ł	W E Whitehead	059140
i	Coupling Soo Car coupling Thill coupling	200,142
ļ	Crote for transporting reactables live poultry	
	oto I W Berene	059 105
1	Orea from mills concretion E. C. Dutler	200,100
ċ	Cream from milk, separating, F.G. Butler	203.100
i	Crusher. See Ore crusher. Quartz crusher.	059 164
i	Cuttor See Dine cuttor	<i>4</i> 00.104
1	Direct acting angles A Thomas	050 010
ŀ	Direct acting engine, A. Thomson	202,913
į	Distillation of coal tar, Trewby & Fenner	252,981
1	Door check, Boldt & Vogel	252,993
ĺ	Draught equalizer, F. B. Hunt	253,056
I.	Draught equalizer, J. M. Langston	253.071
ļ	Dreage winder, S. W. Dana	253,012
ſ	Dreaging machine, Z. Williams	253,145
	Drin. See Kock urill,	
	Drying conce, grain, etc., apparatus for, H. Schol-	050 4
•	neld	253,111
	Egg preserving apparatus, K. 11. Loomis	253,074
	Ejector, steam and air, S. E. Hewes (r)	10,023
	Electric lighting apparatus, J. B. Fuller	253.032
i	Electroplating with platinum and silver, M. H.	050
Ì	Campbell	253,159
	Elevator. See Hydraulic elevator.	
	Elevator, C. W. Baldwin (r)	10,017
	Engine. See Direct acting engine. Oscillating	
	engine. Traction engine. Wind engine.	0
	Envelope opener, W. A. De Caindry	252.930
	Evaporating pan, H. B. Stevens	253,124
	Fabric. See Fringed fabric.	
	Fan, fly, A. Lloyd	252,885
•	Farm gate, D. Spencer	253.119
÷	Faucet, J. O. Waddell	253,186
Ì	Faucet, filtering, W. M. Sack	253,107
j	Fence, A. R. Stormont	253,126
÷	Fence wire strand, barbed, A. Ellwood	253,022
	File, bill, C. W. Hayes	253,041
	Files, etc., sharpening, Tilghman & Mathewson	252.979
	Filter, J. C. Adsit	252.858
	Filter, C. L. Ridgway 253.103.	253,171
	Finger and scarf ring, R. J. La Grange.	253.069
	Finger ring and bracelet. combined. Brunswick &	
	Engel	252,998
	Engel Fire alarm, automatic, P. H. Vander Weyde	252,998 253,133
	Engel Fire alarm, automatic, P. H. Vander Weyde Fire escape, 11. F. Gaines	252,998 253,133 252,938
	Engel Fire alarm, automatic, P. H. Vander Weyde Fire escape, H. F. Gaines Fire extinguisher. C. W. Talcott	252,998 253,133 252,938 253,128
í	Engel Fire alarm, automatic, P. H. Vander Weyde Fire escape, H. F. Gaines Fire extinguisher, C. W. Talcott Fire screen and fender, combined. T. J. Suges	252,998 253,133 252,938 253,128 253,127

(34) C. H. B. asks: What can be used as a substitute for glycerine in printer's rollers besides sugar or molasses? A. We know of nothing that food. The masses do not eat meat simply because they could be used with advantage as a substitute for these in this connection.

(35) H. A. L. asks: 1. How shall I go to work to make an electric light? A See "Simple Electric Light Apparatus," in SUPPLEMENT, No. 159. 2. What chemical will soften silver enough to join two pieces together? A. We know of no chemical that will soften silver so that it may be joined. Silver solder is usually employed for joining pieces of the metal. 3. Will common sweet oil do in place of olive oil for that phosphoric oil as described in No. 318? A. Yes,

ing it, but I can only get a very dim light, and the to the prominent place given to highly nitrogenous f

Artists' use, board or tablet for. S. J. Freshney 253,030	Forgings to steam hammers, device for present-
Auger making machine, P. Mackay 253.076	ing, A. M re 253,088
Bale tie, W. H. King 252,953	Frame. See Picture frame,
3aling press, J. La Dow 252,882	Fringed fabric, S. Garrett 252,875
Bearing, anti-frictional, T. R. Ferrall 252,872	Fruit can, F. B. Ginn 253,035
Bed and foot warmer, E. F. Brigham 252,861	Fur bats, making, W.E. Doubleday
Bed bottom, spring, E. A. Cleaveland 252,867.	Fur-faced articles, machine for beating up the
Bed, cradle, M. Collinson	nap of, W. E. Doubleday 253,161
Beds, table attachment for, R. L. Stokes 252,908	Fur to fibrous goods, sticking, W. E. Doubleday. 253,160
Bedstead, wardrobe, M. Collinson	Furnace. See Heating furnace. Locomotive fur-
Belt tightener, J. Porter 252,969	nace. Regenerative furnace.
Bicycle, T. T. Harrison 252,939	Galvanic battery plates, apparatus for immersing,
Bicycle saddle, A. Rinte(man 252,971	A. J. Holt
Blacking box, A. H. Savage 253.109	Gas, apparatus for manufacturing, T. G. Springer 253,120
Blacking box holder and foot rest, combined, J.	Gas, apparatus for the manufacture of J.S. Piers-
Rees 253,100	son
Blind, window. J. D. Freese 252,873	Gas machine, Flower Jr., & Burgess 253.028
Board. See Wagon tail board.	Gate. See Farm gate.
Boiler. See Steam boiler.	Gates, hanging. W. R. White 252,915
Boilers, connecting sputs to, J Trageser (r) 10,022	Governor. speed, J. Richardsom
Bolt. See Trace fastening bolt.	Grain binder. C. W. Levalley 253.073
Bolt blanks from cold rods of metal, machine for	Grain binder, C. Lidren 253,167
forming, W. E. Ward 252.914	Grain binder knot tying device. Chamberlain &
Boring and cutting implement, I. Sharp 253,115	Austin 253,002
Bottle, nursing, E. O. Day 253,014	Grain binder tension device, J. F. Appleby 252,988
ottle, nursing. S. W. France 252,936	Graining device. C. N. Morris
Bottling machine, R. Otten 252894	Grinding corn. etc., roller mill for, C. Seck 363.113