Planter, walking, J. M. Brown 196,517

(40) J. S. M. says: I wish to paint on por-Also by what method is the finish obtained that causes first and the enamel is burnt in, in a muffle. Prepared colors for painting on china can be purchased of large paint dealers. The burning in must be done by an es

(41) J. H. M. asks how to make a gold soplaters? A. You had better gild in the hot bath. The composition is crystallized phosphate of soda, 21 ozs.; bisulphite of soda, 31/2 ozs.; pure cyanide of potassium i oz.; pure gold, transformed into chloride, i oz.; distilled water, 2i gallons. This is good for silver, bronze, and copper alloys. For wrought iron and steel the bath consists of distilled water, 2; gallons, phosphate of soda, 171/2 ozs.; bisulphate of soda, 41/2 ozs.; pure cyanide of potassium, a oz.; gold (chloride) a oz. It is not necessary to mind the weight of the chloride so long as the proper amount of gold is dissolved in aqua regia.

(42) S. B. H. asks. 1. Are north, south. east, and west relative or absolute terms? A. Relative. 2. State the greatest distance that could be traveled in any direction. A. You might go around the world an same direction according to the compass.

(43) J. E. S. asks how bright crimson writing fluid is made? A. Powdered cochineal, 1 oz.; hot water, 1/2 pint. Digest, and when quite cold add ammonia 1 oz., diluted with 3 or 4 ozs. of water. Macerate for a few days and decant when clear.

(44) G. M. W. asks how to make a good article of yellow soap? A. Tallow and sal soda of each 11/2 lbs.; resin, 56 lbs.; stone lime, 28 lbs.; palm oil, 8 ozs.; soft water, 28 gallons. Put soda lime and water into a kettle and boil, stirring well; then let it settle and pour off the lye. In another kettle melt the tallow, rosin, and palm oil, having it hot, the lye being also boiling hot. Mix altogether, stirring well, and the

(45) K. H. R. asks what laundrymen use use besides starch to give a smooth glossy appearance to starched goods? A. One tablespoonful of strong gum arabic solution to each pint of starch.

(46) C. S. R. says: 1. If I bore a piece of 2 through the center, with 34 inch drill, and previously plug the ends of bore, what internal pressure will the tube resist? A. About 30,000 lbs. per square inch. 2. If I fill the tube with water before closing the ends, to what degree of temperature can it safely be heated without exploding? A. A very slight rise of temperature only would be required. 3. How can the odor of petroleum and kerosene be destroyed? A. There are several patented processes, one of which consists in the use of superheated steam.

(47) C. B. L. says: I have two flywheels, each 1,000 lbs., running at the rate of 50 revolutions per minute; one is 10 feet in diameter and the other is 20 feet in diameter. Which would exert the most controlling influence on an engine, and why? A. The larger wheel would be the most effective, because its actual energy depends on the angular velocity and moment of inertia, both of which increase when the radi us is increased, other things being equal.

(48) E. C. H. says: 1. Of two engines less than 2 horse power,running at 300 revolutions,and steam pressure 80 lbs., one engine having stroke the same as diameter of cylinder, and the other having a stroke twice the diameter of cylinder, which uses steam most economically, both engines cutting off at 34 stroke? If there is a difference, please explain. A. The long stroke engine would ordinarily be the more economical of the two, on account of the higher piston speed and the less percentage of clearance in general. 2. What should be the size of engine ports of a 4×4 engine running 300 revolutions, steam pressure 80 lbs., cutting off at 1 stroke? A. Port area 1/2 square inch at least.

(49) J. D. W. asks: What is the heating surfaceof a boiler 28 feet long, 42 inches in diameter, with five 8 inch flues? A. If the tubes are the whole length of the boiler, the heating surface is about 297

(50) I. L. L. asks: What sized boat would is given. be required for an engine 2 inch bore, 6 inch stroke, with an unright hoiler 4 feet high and 2 feet in diameter and what sized screw? A. Boat 18 to 20 feet long, 5 feet beam, Propeller, 18 to 20 inches diameter, 3 feet pitch.

(51) E. A. B. asks: 1. What are ocean steam boilers made of? A. Wrought iron. 2. Are they upright and tubular? A. Horizontal tubular. 3. Are engines horizontal or upright? A. Vertical generally, in merchant steamers.

(52) F. H. R. asks: Is the pressure of a ply the wants: steam gauge diminished if it be located 20 feet from the boiler, the boiler being three horse capacity? A. Ordinarily, no, if properly located.

(53) F. H. says: 1. Can you give me a rule to find out how much packing is necessary to cover a pipe 105 feet long, diameter of pipe 3 inches, with a covering 3 inches thick; the material weighing 4 lbs. to the square foot? A. Let d= diameter of pipe, in feet. D=diameter of packing, outside, in feet. L=length of pipe in feet. W=weight of packing per square foot. Total weight required=3.1416× $\frac{d+D}{2}$ ×L×W

What is meant by cold short iron? A. Iron that is brittle when cold.

(54) H. A. P. asks: 1. How can I ascertain the horse power of a punching machine, to which steam cannot be applied for the purpose? A. Some form of transmitting dynamometer must be employed. 2. What is the relative toughness of cast steel and the best of "charcoal" iron castings? A. If you refer to tensile strength, the steel is to cast iron about as 5 to 1. 3. What

and add ½ gallon of the spirit to the sediment and ings? A. Cast iron toughened by the admixture of treat as before.

wrought iron scrap. wrought iron scrap.

(55) J. C. wants to know how to drive sevecelain or earthenware. Shall I use water colors or oil? ral tilt hammers off the same driving shafts at varying speeds? Each hammer must be independent of the it to withstand washing, etc.? A. The colors used are others, and the speed easily and immediately alterable enamels mixed with turpentine. The china is glazed to suit the heat being worked. Hammer heads are about 41/2 cwt. weight, so any suitable arrangement must be of a substantial character. Also what are the best kinds of bits and anvils, the present ones of chilled metal get soft in a very short time? A. Friction wheels or clutches will enable you to vary the speed at lution for battery gilding, such as is used by carriage pleasure. The same thing can be accomplished by using a pair of continuous cones connected by a belt. Steel facings may be used for your anvils.

> (56) W. T. B. asks: Are there any schools aching mechanical engineering, and if so, where is the best one, considering expenses? A. There are so many schools of this character that we do not feel inclined to make a comparison. We give a partial list: Lehigh University, University of Pennsylvania, Rensselaer Polytechnic Institute, Massachusetts Institute of Technology, Yale College, Harvard University, Worcester Institute, Stevens Institute of Technology, University of Illinois.

(57) N. W. H. ask3: Which of the two engines below noted will develop the greatest power? One is 8 inch cylinder, 12 inch stroke, 100 revolutions with indefinite number of times, always traveling in the 30 lbs. boiler pressure. The other is 4 inch cylinder, 6 inch stroke, 175 revolutions, with 60 lbs. boiler pressure. Both are the common slide valve type, and both cut off at ? stroke. A. Probably the first would develop about twice as much power as the second.

> (58) A. C. asks: What power can be got from a current wheel? The channel is 50 feet wide and 24 inches deep, with a fall of 24 inches in forty rods. I think of making a wheel 10 feet in diameter and 20 feet long, with 16 paddles. A. With a well designed wheel you may realize about 40 per cent of the effect of the water. This effect in foot lbs. per second=[lbs. of water passing the wheel per second X (velocity of water in feet per second)2]+64.4.

> (59) W. F. S. asks if moonshine has the ame effect on fish to spoil them as sunshine? A. The influence of the moon is restricted to lovers, dogs, and

In our last week's issue the answer to No. 22 of the inquiry column, 3,300 should be 33,000.

MINERALS, ETC.—Specimens have been reinch round bar iron 7 inches long, lengthways ceived from the following correspondents, and examined, with the results stated:

> M. S.-It is zinc blende, and of good quality. Judging from the sample, this ore should yield 40 per cent of zinc. It contains cadmium .- E. A. S .- The substance cannot economically be purified as suggested. If finely ground and weathered for some time, it may answer some of the purposes of whiting. This could best be determined by comparative tests .- A. B. F .-No. 1 is principally carbonate of lead. No. 2 contains much more mineral impurities than No. 1; but both contain enough lead to poison the sugar if, as we understand you, they remain together. This should be known at once.

COMMUNICATIONS RECEIVED.

The Editor of the SCIENTIFIC AMERICAN acknowledges with much pleasure, the receipt of original papers and contributions upon the following subjects:

On the Tides. By U. H. On Petroleum. By W. S. R. On a New Galvanic Battery. By E. G. A. On Matter. By W. B. On Mica Bronze. By R. S. V.

HINTS TO CORRESPONDENTS.

We renew our request that correspondents, in referring to former answers or articles, will be kind enough to name the date of the paper and the page, or the number of the question.

Correspondents whose inquiries fail to appear should repeatthem. If not then published, they may conclude that, for good reasons, the Editor declines them. The address of the writer should always be given.

Inquiries relating to patents, or to the patentability of inventions, assignments, etc., will not be published here. All such questions, when initials only are given, are thrown into the waste basket, as it would fill half of our paper to print them all; but we generally take pleas ure in answering briefly by mail, if the writer's address

WANTS AND BUSINESS INQUIRIES.

Almost any desired information, and that of a business nature especially, can be expeditiously obtained by advertising in the column of "Business and Personal," which is set apart for that purpose subject to the charge mentioned at its head.

We have received this week the following inquiries particulars, etc., regarding which can probably be elicited from the writers by the insertion of a small advertisement in the column specified, by parties able to sup-

Who makes Hyatt's patent sidewalk tiling? Who sells grape sugar? Who makes tile machinery?

OFFICIAL.

INDEX OF INVENTIONS

Letters Patent of the United States were Granted in the Week Ending October 30, 1877,

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

A complete copy of any patent in the annexed list including both the specifications and drawings, will be furnished from this office for one dollar. In ordering, please state the number and date of the patent de and remit to Munn & Co., 37 Park Row, New York city. Advertising device, A. H. Dean 196,639

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Stamp, branding. R. G. Smeaton. Stamp, cancelling, A. Daul. Stamp, perforating, W. W. Eaton. Stave sawing machine, Miller & Head. Steam boiler, duplex, J. B. Rivera. Steam generator, T. F. Butterfield. Steering apparatus, steam, F. E. Sickles. Stove and furnace, A. C. Rand. Stove, cooking, B. F. Holbrook. Stove leg fastening, T. H. Roberts Sucker rod adjuster, W. H. Curtis. Suscher rod adjuster, W. H. Curtis. Suspender ends, clasp for, G. H. Leonard. Tablet, rolling pocket, H. T. Cushman Thill coupling, D. R. Silver. Thill coupling, D. R. Silver. Tobacco pouch, C. A. & N. T. Spence. Toilet case, Carroll & Lee. Toy bird, C. Robinson. Toy buzz, D. T. Snelbaker. Umbrella runner, A. B. Knapp.	196,711 196,638 196,691 196,691 196,559 196,700 196,700 196,528 196,705 196,564 196,568 196,686 196,686 196,696 196,546 196,629 196,704 196,704 196,704 196,704 196,738
Stamp, branding. R. G. Smeaton. Stamp, cancelling, A. Daul. Stamp, perforating, W. W. Eaton. Stave sawing machine, Miller & Head. Steam boiler, duplex, J. B. Rivera. Steam generator, T. F. Butterfield. Steering apparatus, steam, F. E. Sickles. Stove and furnace, A. C. Rand. Stove, cooking, B. F. Holbrook. Stove leg fastening, T. H. Roberts Sucker rod adjuster, W. H. Curtis. Suscher rod adjuster, W. H. Curtis. Suspender ends, clasp for, G. H. Leonard. Tablet, rolling pocket, H. T. Cushman Thill coupling, D. R. Silver. Thill coupling, D. R. Silver. Tobacco pouch, C. A. & N. T. Spence. Toilet case, Carroll & Lee. Toy bird, C. Robinson. Toy buzz, D. T. Snelbaker. Umbrella runner, A. B. Knapp.	196,711 196,638 196,691 196,691 196,559 196,700 196,700 196,528 196,705 196,564 196,568 196,686 196,686 196,696 196,546 196,629 196,704 196,704 196,704 196,704 196,738
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Stamp, branding. R. G. Smeaton. Stamp, cancelling, A. Daul. Stamp, cancelling, W. W. Eaton. Stave sawing machine, Miller & Head. Steam boiler, duplex, J. B. Rivera. Steam generator, T. F. Butterfield. Steering apparatus, steam, F. E. Sickles. Stove and furnace, A. C. Rand. Stove, cooking, B. F. Holbrook. Stove leg fastening, T. H. Roberts. Sucker rod adjuster, W. H. Curtis. Sundial, A. W. Anderson. Suspender ends, clasp for, G. H. Leonard. Tablet, rolling pocket, H. T. Cushman Thill coupling, p. R. Silver. Thill coupling, spring for, H. Beard. Tobacco pouch, C. A. & N. T. Spence. Tojet case, Carroll & Lee. Toy bird, C. Robinson. Toy buzz, D. T. Snelbaker. Umbrella runner, A. B. Knapp. Vehicle axles, splicing bar for, I. Arthur.	196,711 196,638 196,647 196,691 196,597 196,559 196,709 196,528 196,705 196,564 196,568 196,636 196,636 196,640 196,54 196,54 196,54 196,704 196,713 196,713 196,719 196,719
Stamp, branding. R. G. Smeaton. Stamp, cancelling, A. Daul. Stamp, cancelling, W. W. Eaton. Stave sawing machine, Miller & Head. Steam boiler, duplex, J. B. Rivera. Steam generator, T. F. Butterfield. Steering apparatus, steam, F. E. Sickles. Stove and furnace, A. C. Rand. Stove, cooking, B. F. Holbrook. Stove leg fastening, T. H. Roberts. Sucker rod adjuster, W. H. Curtis. Sundial, A. W. Anderson. Suspender ends, clasp for, G. H. Leonard. Tablet, rolling pocket, H. T. Cushman Thill coupling, p. R. Silver. Thill coupling, spring for, H. Beard. Tobacco pouch, C. A. & N. T. Spence. Tojet case, Carroll & Lee. Toy bird, C. Robinson. Toy buzz, D. T. Snelbaker. Umbrella runner, A. B. Knapp. Vehicle axles, splicing bar for, I. Arthur.	196,711 196,638 196,647 196,691 196,597 196,559 196,709 196,528 196,705 196,564 196,568 196,636 196,636 196,640 196,54 196,54 196,54 196,704 196,713 196,713 196,719 196,719
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Stamp, branding. R. G. Smeaton Stamp, cancelling, A. Daul Stamp, perforating, W. W. Eaton Stamp, perforating, W. W. Eaton Stame, perforating, W. W. Eaton Stame sawing machine, Miller & Head Steam boiler, duplex, J. B. Rivera Steam generator, T. F. Butterfield Steering apparatus, steam, F. E. Sickles Stove and furnace, A. C. Rand Stove, cooking, B. F. Holbrook Stove leg fastening, T. H. Roberts Sucker rod adjuster, W. H. Curtis Sundial, A. W. Anderson Suspender ends, clasp for, G. H. Leonard Tablet, rolling pocket, H. T. Cushman Thill coupling, D. R. Silver Thill coupling, pring for, H. Beard Tobacco pouch, C. A. & N. T. Spence Toilet case, Carroll & Lee Toy bird, C. Robinson Toy buzz, D. T. Snelbaker Umbrella runner, A. B. Knapp Vehicle axle, A. K. Stone Vehicle spring brace, M. Newton Vehtileting passage, regulator for, H. M. Lane	196,711 196,683 196,697 196,599 196,709 196,709 196,528 196,706 196,528 196,705 196,546 196,558 196,558 196,658 196,658 196,678 196,546 196,713 196,546 196,719 196,719 196,719 196,719 196,719 196,719 196,719
Stamp, branding. R. G. Smeaton. Stamp, cancelling, A. Daul. Stamp, cancelling, W. W. Eaton. Stamp, perforating, W. W. Eaton. Stave sawing machine, Miller & Head. Steam boiler, duplex, J. B. Rivera. Steam generator, T. F. Butterfield. Steering apparatus, steam, F. E. Sickles. Stove and furnace, A. C. Rand. Stove leg fastening, T. H. Roberts. Stove leg fastening, T. H. Roberts. Sucker rod adjuster, W. H. Curtis. Sundial, A. W. Anderson. Suspender ends, clasp for, G. H. Leonard. Tablet, rolling pocket, H. T. Cushman. Thill coupling, p. R. Silver. Thill coupling, spring for, H. Beard. Tobacco pouch, C. A. & N. T. Spence. Tojet case, Carroll & Lee. Tojo bird, C. Robinson. Toy buzz, D. T. Snelbaker. Umbrella runner, A. B. Knapp. Vehicle axles, splicing bar for, I. Arthur. Vehicle spring brace, M. Newton Ventilating passage, regulator for, H. M. Lane. Vise, Henson & Osborn.	196,711 196,682 196,697 196,597 196,709 196,709 196,700 196,528 196,705 196,528 196,528 196,528 196,630 196,63
Stamp, branding. R. G. Smeaton. Stamp, cancelling, A. Daul. Stamp, cancelling, W. W. Eaton. Stamp, perforating, W. W. Eaton. Stave sawing machine, Miller & Head. Steam boiler, duplex, J. B. Rivera. Steam generator, T. F. Butterfield. Steering apparatus, steam, F. E. Sickles. Stove and furnace, A. C. Rand. Stove leg fastening, T. H. Roberts. Stove leg fastening, T. H. Roberts. Sucker rod adjuster, W. H. Curtis. Sundial, A. W. Anderson. Suspender ends, clasp for, G. H. Leonard. Tablet, rolling pocket, H. T. Cushman. Thill coupling, p. R. Silver. Thill coupling, spring for, H. Beard. Tobacco pouch, C. A. & N. T. Spence. Tojet case, Carroll & Lee. Tojo bird, C. Robinson. Toy buzz, D. T. Snelbaker. Umbrella runner, A. B. Knapp. Vehicle axles, splicing bar for, I. Arthur. Vehicle spring brace, M. Newton Ventilating passage, regulator for, H. M. Lane. Vise, Henson & Osborn.	196,711 196,682 196,697 196,597 196,709 196,709 196,700 196,528 196,705 196,528 196,528 196,528 196,630 196,63
Stamp, branding. R. G. Smeaton. Stamp, cancelling, A. Daul. Stamp, perforating, W. W. Eaton. Stave sawing machine, Miller & Head. Steam boiler, duplex, J. B. Rivera. Steam generator, T. F. Butterfield. Steering apparatus, steam, F. E. Sickles. Stove and furnace, A. C. Rand. Stove leg fastening, T. H. Roberts. Stove leg fastening, T. H. Roberts. Sucker rod adjuster, W. H. Curtis. Suscher rod adjuster, W. H. Curtis. Suspender ends, clasp for, G. H. Leonard. Tablet, rolling pocket, H. T. Cushman. Thill coupling, D. R. Silver. Thill coupling, spring for, H. Beard. Tobacco pouch, C. A. & N. T. Spence. Toy bird, C. Robinson. Toy buzz, D. T. Snelbaker. Umbrella runner, A. B. Knapp. Vehicle axles, splicing bar for, I. Arthur. Vehicle spring brace, M. Newton Ventilating passage, regulator for, H. M. Lane. Vise, Henson & Osborn Watch case spring, D. C. Voss.	196,711 196,682 196,697 196,597 196,709 196,709 196,709 196,700 196,528 196,705 196,560 196,560 196,560 196,561 196,561 196,601 196,704 196,704 196,704 196,704 196,704 196,704 196,704 196,704 196,704 196,602 196,602 196,602
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Stamp, branding. R. G. Smeaton. Stamp, cancelling. A. Daul. Stamp, perforating. W. W. Eaton. Stave sawing machine, Miller & Head. Steam boiler, duplex. J. B. Rivera. Steam generator, T. F. Butterfield. Steering apparatus, steam, F. E. Sickles. Stove and furnace, A. C. Rand. Stove, cooking. B. F. Holbrook. Stove leg fastening, T. H. Roberts. Sucker rod adjuster, W. H. Curtis. Sundial, A. W. Anderson. Suspender ends, clasp for, G. H. Leonard. Tablet, rolling pocket, H. T. Cushman. Thill coupling, D. R. Silver. Thill coupling, spring for, H. Beard. Tobacco pouch, C. A. & N. T. Spence. Tojet case, Carroll & Lee. Toy bird, C. Robinson. Toy buz, D. T. Snelbaker. Umbrella runner, A. B. Knapp. Vehicle axles, splicing bar for, I. Arthur. Vehicle srieg, A. K. Stone. Vehicle axles, splicing bar for, I. Arthur. Vehicle axles, splicing bar for, I. Arthur. Vehicle axles, splicing for, L. Van Doren. Watch case spring, D. C. Voss. Watches, dial fastening for, L. Van Doren. Water Closet, M. Sulbacher. Well boring apparatus, C. B. Hewitt Wind wheel, Lowry & Hunt. Wind wind Wind wheel, Lowry & Hunt.	196,711 196,684 196,691 196,599 196,709 196,709 196,700 196,528 196,52
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