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Wanted—A Bone Crusher, suitable for crushing bones size of nut coal. A stamp mill preferred. P. O. Box 3869, Boston.

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For Sale—37 in. x 15 1/2 ft. Lathe, \$300; 18 in. x 12 ft. Lathe, \$250; 12 in. x 6 ft. Lathe, \$125; 43 in. Chucking Lathe \$195; 16 ft. Planer, \$700; 6 ft. Planer, \$275; 4 ft. Planer, \$175; 9 ft. Planer, \$575. Shearman, 45 Cortlandt St., N. Y.

Wanted—One Heavy Drop, with 600 lb. Hammer, and one Facing Machine. Address P. O. Box 2258, New Haven, Conn.

1/2, 1, & 2 Horse Engines, \$30, 60, & \$100; Boilers for same, \$75 & \$100. T. B. Jeffery, 253 Canal St., Chicago.

For Sale—Engine 4x3; no boiler—new—cheap—good. Will send pho. A. R. C., Lincoln, Ill.

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An Erector, Engineer, and general Machinist desires a permanent engagement. References furnished. Address D. C., 29 Concord St., Brooklyn, N. Y.

Wanted—A Combined Power Punch and Shears for ordinary work. Address Loudon M'f'g Works, Fairfield, Iowa.

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Abb Bolt Headers, the best—Prices reduced; 2 sizes made. Palmer Power Spring Hammers, 10 sizes. See machines, or write for information before buying. S. C. Forsyth & Co., Manchester, N. H.

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For Sale—Second Hand Wood Working Machinery. D. J. Lattimore, 31st & Chestnut St., Phila., Pa.

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Hotchkiss & Ball, Meriden, Conn., Foundrymen and workers of sheet metal. Fine Gray Iron Castings to order. Job work solicited.

Peck's Patent Drop Press. Still the best in use. Address Milo Peck, New Haven, Conn.

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For best Bolt Cutter, at greatly reduced prices, address H. B. Brown & Co., New Haven Conn

Diamond Tools—J. Dickinson, 64 Nassau St., N. Y.

Temples and Oilcans. Draper, Hopedale, Mass.

Notes & Queries

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(1) C. M. B. asks: Will iron decompose corrosive sublimate? Last spring I stuffed a few birds, and used a solution of corrosive sublimate, applying it with a small piece of common cotton batting on an iron wire. In the course of about two months the wire rusted, and the cotton appeared to be full of quicksilver, in little spheres, from the size of a pin's point to that of a pin's head. A. Yes. The action is accompanied by the formation of a basic chloride of iron and a separation of subchloride of mercury.

(2) L. E. B. asks: 1. Is there any known way to dry fish offal without the use of the patent dryer? A. Send us a sample of the patent dryer you have reference to. So much depends upon the condition of the materials, and the temperature at which the operation takes place, that it is impossible to give any very decisive answer. 2. When it is dried, what proportion of ammonia could I safely calculate on obtaining from it? A. The average amount of available nitrogenous matter contained in such waste is from 8 to 10 per cent.

(3) S. E. T. asks: 1. What are grape spirit, French spirit, corn spirit, and English spirit as used by perfumers? A. Grape spirit is the spirit of wine; corn spirit that obtained by the fermentation of corn. The other two grades we do not recognize by the names you give them. 2. Is spirit of jasmine the same as extract of jasmine? A. Probably.

(4) R. H. B. says: I use 8 inch welded boiler flues for stove pipes, etc. How can I cut off the rain at the roof or catch the water below? A. Construct two conical flanges around the flue pipe where it connects with the roof, above the latter, with the largest end of the cones downward; secure the bottom edge of the lower one to the roof, and the top edge of the upper one to the pipe, by soldering or by packing within a ferrule. The upper cone will serve as a cape over the lower one; and as they are not fastened to one another, no harm can come from expansion and contraction.

(5) J. F. M. & B. ask: Can you inform me of an easy manner of steaming geese feathers? We have plenty of steam. A. The feathers may be placed in a long tubular vessel surrounded by a steam jacket. In order to prevent any tendency to condensation of the steam as it passes through the vessel, it should be considerably superheated before being allowed to enter, and be passed through as rapidly as the case will permit.

(6) W. B. W. asks: What substance or substances of a quickly drying and gummy nature will serve as a vehicle for sulphuric acid, or any other acid that will quickly destroy vegetable tissue, without neutralizing the acid or destroying the properties of the vehicle? A. We do not think it is practicable to use any of the stronger acids in the way you propose. All such substances as the gums, gum resins, and oils are more or less

acted upon by acids, if the latter are sufficiently strong to accomplish the destruction of vegetable fiber.

(7) A. B. asks: How can I clean jugs in which linseed oil has been kept for a long time, so they will not smell like the oil? A. Remove as much of the oil as possible by means of naphtha or benzine, and then wash the interiors well with a concentrated hot solution of potash or soda (lye). Finally rinse with clean water.

(8) J. M. C. asks: What are the greatest conditions of safety under which a steam boiler can be operated? I wish to use a three horse power engine three or four times per week, about five hours at a time; if I get a boiler large enough to run the engine that length of time without adding any water (not providing any pump) the boiler being tested to 150 lbs. and having a valve set to blow off at 50 lbs. pressure, would not danger of explosion be entirely obviated? A. These conditions, supplemented by careful management, should ensure safety in a high degree.

(9) J. H. S. says: I have a bath tub set in wood. How can I paint or coat the surface with an imitation of marble that will resist water? A. The following has been used for this purpose: Boila quantity of water glass (silicate of soda) in water until a clear sirupy liquid is obtained; then add sufficient oxide of zinc to form a stout body color, and apply several coats to the woodwork if necessary.

(10) J. W. S. says: In your article on p. 233, vol. 29, on molding rubber, you say: "Immerse the rubber in a mixture of bisulphuret of carbon 95 parts, and rectified spirits 5 parts, until it swells into a pasty mass. It may then be molded into any form required." I can dissolve the rubber nicely, but cannot form it in a mold. You say: "Your trouble probably arose from using vulcanized rubber. Try pure rubber in bisulphide of carbon and rectified spirits." I inclose a small piece of the rubber which I used. What is the difficulty? A. Bisulphide of carbon is the most usual and best solvent for caoutchouc (india rubber). This solution, owing to the volatility of the menstruum, soon dries, leaving the caoutchouc in its natural state. When alcohol is mixed with the sulphide of carbon, the latter does not any longer dissolve the caoutchouc, but simply softens it. Alcohol precipitates solutions of caoutchouc.

(11) F. L. B., of Yokohama, Japan, says: I am manufacturing safety matches, and find that they become soft in the warm, damp weather which we have here during the summer months. I use chlorate of potassa, oxide manganese, sulphuret antimony, sulphur, and glass, and the best glue for the matches, and amorphous phosphorus, sulphuret antimony, and glue for the boxes. English matches stand this climate, and they are not varnished. What can I use that will keep the composition ends free from the influence of the weather? A. Collodion has been used for this purpose with very good results.

(12) M. R. H., of Manheim, Germany, says: We have a brick room or oven with an iron floor. By means of furnaces underneath, it is gradually heated (during 12 hours) to 295° Fah. What liquid or substance can be put into an iron globe, communicating with a pipe outside the building, to cause a piston to rise as the heat inside is developed? A. Let the pipe from the globe turn downwards outside the room, a certain distance determined by experiment, and then bend and turn up again in a vertical position; fill the pipe outside the room with water, thus enclosing a certain quantity of air within the globe and in that portion of the pipe which is in the room. Now, if you provide a float upon the surface of the water in the exterior vertical pipe, as a piston, the expansion of the air in the globe will raise the water and the float, without making steam, and so effect the object you desire.

(13) J. S. C. asks: What are the causes of loss of power in the reciprocating engine, and what is the percentage of the loss from each cause? A. The following table, from an article by Messrs. Hunt and Skeel, on "The Methods of Testing Steam Engines," gives a good idea of the quality and amount of the losses, in the case of a condensing engine connected to a propeller:

Table with 2 columns: Units of heat in 100 lbs. anthracite, and Per cent. Rows include Heat equivalent to weight of ashes, Total heat in 100 lbs. of anthracite, Carried off by hot gases in chimney, Available to produce steam, Lost by leakage and condensation, Available for work in cylinder, Escaped with steam into condenser, Transformed into work, Absorbed by friction, etc., of engine, Available for useful work, Absorbed by friction, etc., of propeller, Usefully applied to propulsion.

(14) J. B. M. says: We have a yacht 32 feet long by 6 feet 4 inches beam. Would it make greater speed with two propellers of 26 inches diameter and 35 inches pitch, driven by two engines of 3 inches diameter by 5 inches stroke, than with one propeller of 36 inches diameter and 3 1/2 feet pitch, driven by 1 engine of 4 inches diameter and 6 inches stroke, boiler being same in both cases? A. You do not send sufficient data to enable us to form an opinion. Other things being equal, however, one screw is generally preferable. Of course there may be special cases, as with yachts of very slight draft, where better results might be obtained by using two propellers.

(15) E. R. asks: Will a half horse power motor be large enough to propel a boat 20 feet long by 5 1/2 feet wide, and 5 inches deep at the bow and 16 inches at the stern? A. The boat will not be very effective under the circumstances. 2. I want to use a 16 inch propeller wheel, and drop it 2 inches below the bottom of boat. What pitch shall I give the wheel? A. You can make the pitch of the propeller from 27 to 30 inches.

(16) W. H. B. says: In answer to a question as to pressure in a boiler, you say: "There is a little more pressure at the bottom." I suppose you mean that the weight of the water gives the over pressure, and that, aside from that, the pressure is equal. Am I correct? If so, is the answer a correct one? Does not the water (at its surface) resist the action of the steam in a downward direction? And is not the pressure carried through the whole body of water to the lower part of the boiler? Suppose the boiler is half full of water. Then the upper part of the boiler (on which the steam acts directly) is 1/2 greater than the surface of the water; and if steam presses equally upon every square inch of surface, then (aside from the weight of water) there is 1/2 more pressure on the upper part of the boiler. If this is not true, please explain why? A. Your idea in regard to the weight of the water increasing the pressure on the bottom is correct. You will find the other part of your query answered in any good treatise on the pressure of fluids.

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

G. F.—It is a cast of a fossil plant in sulphuret of iron. The material is not valuable.—J. F. B.—It is sulphuret of iron.—J. A. M.—It is hydrated sesquioxide of iron mixed with clay. By burning, it is converted into an inferior brown umber. Mix minium to change its color to a red.

J. M. H. Jr. asks: Can you give me a recipe for making decalcomanie varnish?—R. M. asks: Are black pearls of commercial value?—J. W. C. asks: How are gelatin capsules, such as are filled with various medicines, made?—J. A. B. asks: How can I make a polish or varnish for rubber shoes?

COMMUNICATIONS RECEIVED.

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

- On Coal Mine Explosions. By J. F. R.
On a Curious Tree. By W. J. McG.
On Safe Launches. By P.
On Etheric Force. By J. R.
On Water Pressure in Mains. By J. C.

Also inquiries and answers from the following: J. C. H.—H. L.—M. C.—P. S.—J. B. D.—R. S. P. R. S. R.—T. H.—C. H.—A. C.—A. A.—W. W.—H. L.—T. M.—F. W. C.—J. C.—J. K.—B. L.

HINTS TO CORRESPONDENTS.

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

Enquiries 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 pleasure in answering briefly by mail, if the writer's address is given.

Hundreds of inquiries analogous to the following are sent: "Whose electro-motor is the best? Whose is the best apparatus for drying and evaporating, using steam as the heating medium? Who sells small balloons? Who makes a barometer with a self-adjusting scale? Whose is the best pump for raising water from a mine 45 feet deep? Who makes lead chambers for sulphuric acid works, and what do they cost?" All such personal inquiries are printed, as will be observed, in the column of "Business and Personal," which is specially set apart for that purpose, subject to the charge mentioned at the head of that column. Almost any desired information can in this way be expeditiously obtained.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH Letters Patent of the United States were

Granted in the Week Ending

January 4, 1876.

AND EACH BEARING THAT DATE.

[Those marked (r) are reissued patents.]

Table listing inventions and their patent numbers. Includes Addressing machine, Air compressor, Alarm, automatic fire, Alphabet board and block, Awl handle, Bag fastener, Baggage check, Balance, spring, Bale bands, punching, Bales, untying cotton, Barrel-pitching machine, Bayonet clamp, Bearing, anti-friction, Bed bottom, spring, Bedstead, folding, Bitters, Boat, life, Boats, towing canal, Boiler for steam heaters, Bolley plates, machine for shearing, Bolt for windows, Boot protector, Boots, making, Box-trimming machine, Bracket, adjustable, Bridge, floating draw, Bronze, aniline, Burner for gasstoves, Burner, gas, O. J. McGann, Burner, vapor, A. H. Watkins.



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 Paddle wheel, J. Kampman..... 171,818  
 Padlock, J. L. Hirsch..... 171,806  
 Paint, liquid, J. Peart..... 171,915  
 Pan, milk and cheese, H. W. Horton..... 171,667  
 Paper box, R. Ritter..... 171,866  
 Paper fastener, J. Adair..... 171,713  
 Paper for postage stamps, etc., J. Schnoble..... 171,871  
 Paper pulp stock grinder, J. P. Labrousse..... 171,822  
 Pencil box, J. Reckendorfer..... 171,860  
 Perambulator, J. Lauer..... 171,824  
 Piano truck, C. A. French..... 171,657  
 Pillow, dress, B. and E. B. Witherell..... 171,902  
 Pipe, water, J. C. Robrnan (r)..... 6,834  
 Pipes, trap for sewer, W. A. Pitt..... 171,849

5,541.—A. Christin, Chicago, Ill., U. S. Bottle stopper. Jan. 3, 1876.  
 5,542.—A. D. Crosby, Cuba, N. Y., U. S. Chain pump bucket. Jan. 3, 1876.  
 5,543.—S. C. Hamlin, Ypsilanti, Mich., U. S. Rubber bucket for chain pumps. Jan. 3, 1876.  
 5,544.—H. N. Slater, Webster, Mass., U. S. Process of flocking cloth. Jan. 3, 1875.  
 5,545.—H. Gillmore, Simcoe, Ont. Sash holder. Jan. 5, 1876.  
 5,546.—H. Wells, Ottawa, Ont. Revolving drag harrow. Jan. 8, 1876.  
 5,547.—W. P. Widdifield, Siloam, Ont. Weather strips. Jan. 8, 1876.  
 5,548.—A. Newell, Chicago, Ill., U. S., et al. Constructing dead pulleys. Jan. 10, 1876.  
 5,549.—D. S. Cornell, Warwick, Ont. Barrel. Jan. 10, 1876.  
 5,550.—D. S. Cornell, Warwick, Ont. Barrel and cylindrical box. Jan. 10, 1876.  
 5,551.—G. J. Tandy, Kingston, Ont. Boiler for steam engines, etc. Jan. 10, 1875.  
 5,552.—J. Hawes, Worcester, Mass., U. S. Egg beater and mixer. Jan. 10, 1876.  
 5,553.—G. W. Robinson, Bennington Center, Vt., U. S. Hand corn planter. Jan. 10, 1876.  
 5,554.—A. Smith, Clifton, Ont. Applying liquid fuel to the heating of metals, etc. Jan. 10, 1876.  
 5,555.—A. W. Shaw, Saccarappa, Me., U. S. Hydraulic cement. Jan. 10, 1876.  
 5,556.—W. D. Eddy et al. Fanning mill and elevator attachment. Jan. 10, 1876.  
 5,557.—G. W. Johnson, Yarmouth, N. S. Pump. Jan. 10, 1876.  
 5,558.—C. L. Jeffords, Jamestown, N. Y., U. S. Converting cast iron into steel. Jan. 10, 1876.  
 5,559.—F. Beauchemin, Roltton Falls, P. Q. Dough mixing machine. Jan. 10, 1876.  
 5,560.—W. Milner, Strathroy, Ont. Door base protector. Jan. 10, 1876.  
 5,561.—J. H. Grant, Grimsby, Ont. Mowing and reaping machine. Jan. 10, 1876.  
 5,562.—A. S. Buckelew, Jersey City, N. J., U. S. Watch case spring. Jan. 10, 1876.  
 5,563.—T. J. O'Sullivan, Hamilton, Ont. Heating drum. Jan. 10, 1876.  
 5,564.—R. D. O. Smith, Washington, D. C. Water closet. Jan. 10, 1876.  
 5,565.—F. G. Butler, Bellows Falls, Vt., U. S. Horse rake. Jan. 10, 1876.  
 5,566.—T. Northey, Hamilton, Ont. Steam pump or boiler feeder. Jan. 10, 1876.  
 5,567.—W. T. Lintner et al., Fort Plain, N. Y., U. S. Pad for chair legs. Jan. 10, 1876.  
 5,568.—B. Barker, Ellsworth, Me., U. S. Stave-jointing machine. Jan. 10, 1876.  
 5,569.—J. Woolridge, Dean's Corner, Ill., U. S. Land roller. Jan. 10, 1876.  
 5,570.—G. Blatchford, Mitchell, Ont. Reed organ. Jan. 10, 1876.

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