Drill press, A. E. Johnson
 458,531

 Inst collector, H. A. & C. A. Barnard
 458,933

strong enough to float an egg. Used to preserve eggs, which it is said it will do for two years, by simply keeping them in it. But we have not tested the pro

(3345) A. W. writes: I want to make a frame with a strong cloth fastened around it, about 3 feet by 4 feet, so I can use it to sketch on with chalk. colored or black, and afterward wash it off clean with a sponge. Glass ground is liable to break, and a board that wide cannot be had here, and would be heavy. I have been using common cheap muslin, and getting it washed after, and using it over again. Cannot cloth (muslin) be prepared in some way as to be used for e above purpose like a blackboard, but white? A. You can prepare cloth like a blackboard by several inside and outside of the jars to make sure of the jars coats of paint, rubbing down between times with ground pumice. As a final coat use white lead mixed with enough ground pumice to give a "tooth" to the cloth. Or you may use shellac varnish mixed with Chinese white and ground pumice as the final coat.

(3346) J. E. E.—Gutta percha is made to adhere and act as cement by means of heat. One of the most convenient ways of using it is to place a thin sheet of the percha between the surfaces to be joined and then apply heat by means of a hot pressing iron applied on the back of the leather until the heat strikes through and melts the percha. This is the mode used by tailors in cementing leather and cloth to cloth. Thin sheet percha is on the market for this purpose. Another method is to dissolve the guttapercha in bisulphide of carbon. Apply the solution to the surfaces to be joined. Let dry. Then place the coated surfaces together and apply heat as before described until the gutta percha is melted and the part thereby cemented together.

(3347) L. H. W. asks: What can I get to wash over stone that is perishing, crumbling away, rubs off like sand? It is Ohio sandstone. Also what kind of cement can I get that will fasten on corners and slivers knocked off, so that they will stay and not attract attention ? A. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 526, for illustrated account of the preserving process for the obelisk and discussion on preservation of stone, brick, etc.

Cement for sandstone; Dry clean fine sand....... 20 parts. Litharge 2 Mix with boiled linseed oil to a thick paste.

Plaster of Paris colored with any dry paints to a suita ble color then quickly wet to a paste andapplied makes a good cement where not exposed to the weather.

(3348) I. A. L. says: I see in the Sci-ENTIFIC AMERICAN, No. 8, August 22, that "oak timber loses about one-fifth of its weight in seasoning and about one-third its weight in becoming dry." Are drying and seasoning different things? Please explain. A. Lumber, when only seasoned or air-dried, is not free from moisture. There is a further loss of moisture and weight by thoroughly drying by heat.

(3349) J. S. L. says: I am running a light locomotive. Can I divide the lead of the valve while it is being run very slowly in this manner: Have the lead openings marked on the valve stem, then take a divider and mark the center of the distance between the two marks? Would the valve be made to cut off true if the eccentric rod was lengthened or shortened as the case may require, so that the valve will travel as far beyond the center mark one way as the other? A. Your method of finding an error in length of connecting rod

(3350) J. O. says: Will you let me know whether you can drive a pipe two inches in diameter for a well twenty feet deep with a sledge, and if you strike a stone, will you please let me know what to do? A. Yes, you can drive 20 feet with a sledge with a hickory block on the drive cap. Well pipes should be driven with a wooden maul or drop; hickory or locust is best. If stopped by a stone, pull up and start a little way off. A steel cap is good to strike on. See Scien-TIFIC AMERICAN SUPPLEMENT, No. 107, on methods of driving well pipes.

(3351) G. J. L. asks: 1. How can I remove the size from one corner of a piece of paper without discoloration of the same? A. Wet the size with a soft sponge, and after it becomes thoroughly dissolved apply a piece of blotting paper to absorbit. Repeat the operation if necessary. 2. I have built an electric motor according to SUPPLEMENT, Nos. 161 and 599, but it does not work, and I am going to build a new armature. What size wire should I wind the armature with to make a motor to run a sewing machine? A. The motor, as described, should run a sewing machine with a current from four cells of a large plunging battery.

(3352) J. G. asks: 1. What should the dimensions of a boiler for a small engine (nearly 1 horse) power) be for running the 8 light dynamo with incan-descent lamps? Will No. 16 or 18 galvanized iron air, the water in the atmosphere probably being the answer for this boiler? Should the dynamo be connected up in shunt or series? A. Your boiler should have 20 square feet of heating surface. For small boiler construction for amateurs see SCIENTIFIC AMERI-CAN SUPPLEMENT, No. 702, with illustrations and dimensions. Galvanized iron is not suitable for steam boilers. Not less than three-sixteenths iron should be used for a 114 horse power boiler shell. Connect the dynamos in series, as shown in Scientific American SUPPLEMENT, No. 600.

(3353) E. K. H. asks how to mend meerschaum, or how it can be glued. A. Caseine cement is recommended for this purpose. Boil fresh cheese in water until it is ropy. Dissolve it in water glass or solution of silicate of sodium, stir into it calcined magnesia and use at once. Use equal weights of che ese and water glass solution, and as much magnesia as will mix with it.

(3354) W. S. writes: I have been copper plating the ends of carbon plates for bichromate battery and have washed them well with clean water, but after a short time sulphate of copper bas formed on them and broken the soldered connections What is the cause and prevention of this? A. To pre-

(3355) F. E. C. asks with what to coat stoneware jars where glazing is defective, to render them airtight for preserving purposes. A. Heat the jars to a temperature of boiling water, or a little hotter if possible, and rub paraffin all over the unglazed spots until they have absorbed as much as possible. It is tasteless and harmless, and may be put on being airtight.

(3356) R. C. B. asks how to make the best kind of a battery for an electric bell. A. There is nothing better for an open circuit electric bell than the Leclanche battery. You will find this described in SUPPLEMENT, No. 159, also in "Experimental Science."

(3357) W. E. F. asks how to clean and brighten small brass work to be lacquered. Have tried different mixtures of acids, but do not get good results The acid will either not clean or the work will tarnish (turn black) immediately on taking from the running water. A. The brass must be thoroughly cleaned from grease or dirt before dipping, by boiling in strong caus tic sodawater; wash in hot water, then dip. We do not know of a better mixture than equal parts of nitric and sulphuricacids, with half a part of muriatic. Dip but a few seconds and immediately plunge the brass in boiling hot water and dry quickly. Cold water will not clear the acid from the porous metal to you Butt's " Tinman's Manual," \$1.25 mailed, which has a variety of receipts for dipping metals.

(3358) T.J. asks for recipes for some cheap wash that will protect a wall plastered with common mortar against the effect of rain and consequently from frost. How will skim milk with lime or cement do? How about the solutions of oxide of zinc and chloride of zinc? Would a wash with Portland cement be sufficient? A. Whitewash used on United States public works: % bushel best lime slaked with boiling water, 1 peck salt dissolved in warm water, 3 pounds ground rice boiled to a thin paste, 1/2 pound ground whiting, and 1 pound clear glue dissolved in warm water. Mix all together, add bot water for proper use, and let stand for several days. Then heat and apply with large brushes. Chloride and oxide of zinc are good but expensive. Portland cement makes a fair brown wash. Skim milk may be used with cement and zinc oxides

(3359) W. J. U. says: I contemplate building, for a shallow crooked river, a steamboat 65 feet long by 16 feet beam, maximum draught when loaded 2 feet (current 21/2 miles per hour); have been advised to put in a single engine to operate four 2 feet propeller wheels by beyel friction, each wheel to be reversed or stopped with engine always going one way. Do you think this will be as good a plan as the ordinary double engine and stern wheel of the river boats? If so, what power should be used to make a speed of 12 miles per hour? A. We do not advise the four small screws for your boat. They are difficult to connect properly, and bevel friction is not suitable or reliable for operating propeller screws, and gearing is too noisy. You will need at least 35 horse power. We recommend a stern wheel with two engines. See SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 398, 217, for illustrations of stern wheel steamers.

(3360) J. H. L. asks: Is it the best to shut up all doors and windows or let as much air get in as possible during electric storms? A. We think the better plan is to close all doors and windows, as a column of warm air issuing from the house would tacilitate the passage of the electric discharge.

(3361) W. A. A.—The insect is the common mole cricket, Gryllotal pa borealis.

(3362) E. W.-Nigrosine is a coal tar color prepared from the hydrochloride of violaniline. This product is variously modified in the process of manufacture several shades, varying from blue through bluish gray to gray, violet to black, this last being called nigrosine, are produced. Other names for the various other shades are violaniline, elberfeld blue, bengaline, aniline gray, Confier's blue, etc.

(3363) J. C. M.—See SCIENTIFIC AMERI-CAN SUPPLEMENT, No. 51, on the manufacture of zinc white; carbonate of baryta is used to adulterate both zinc white and white lead. Chemical analysis is the

(3364) G. H., Jr., asks: 1. Why is the rising moon red? A. Because of the absorption of the more refrangible rays of light by the great distance that the moon's rays pass through the atmosphere at rising air, the water in the atmosphere probably being the most active agent of absorption. The midday sun looks red as seen from a considerable depth in water. Divers notice this peculiarity. 2, Where is the largest marble cutting establishment in the world? The largest marble works are near Rutland, Vermont. 3. I have a copper bath tub which is coated with tin or zinc. This bright coating has worn off in places and the copper turned black. Is there any way in which I can recoat these injured places? A. You can do nothing better than to keep the bath tub clean by polishing with sapolio, or with oxalic acid. You cannot retin the

(3365) J. F. M. asks: What is the inclosed powder? It is used in the porous cup of a battery. A. The powder is principally or entirely potassium nitrate, common saltpeter. In the porous cup mixed with dilute sulphuric acid it supplies free nitric acid as a depolarizer.

(3366) W. W. B. asks: 1. What chemicals and in what proportion, added to water, will extinguish fire? A. Most alkaline salts dissolved in sufficient Quantity in water act as extinguishers. Sulphate of sodium is excellent. Bicarbonate of ammonium is good, as yielding a certain amount of carbonic acid gas. | Drill. See Rock drill,

vent the battery solution from acting upon the copper | 2. How can a photographic plate be developed a posifilm deposited on the carbon, you will need to paraffine tive? A. This has not been done except experiment-the end of the carbon, that is to say, you should heat ally. No practically successful process is known. Sevthe carbon and rub on paraffine until the extreme end | eral investigators are now working on the problem. 3. of the carbon is saturated. You can electroplate on Explain E.M.F., which so often appears in these this and solder your connections to the electroplated columns. A. Electromotive force, or the difference of potential which is the cause of a current of electricity. It is produced by batteries and dynamos in general practice.

TO INVENTORS

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Lock case, W. H. Taylor Lock book, F. Splittstoser Locen otive cab windows dust guard for F.	458,863 . 458,779
Bond. Locomotive spring, W. E. Ludium. Locomotor, electric, H. F. & G. F. Shaw.	458,939 458,705 458,729
Loom stopping mechanism, J. Hayes Lorgnette or opera-glasses, J. Green. Low water alarm and boiler feeder. W.	458,624 458,73
McLauchlin. Lubricator. See Journal box lubricator. Lubricator. A. McNett.	458,794
Lumber clamp, W. A. Madden. Mil bag catcher, G. W. Smi h. Mail bag fastening, C. T. Anderson.	458,763 458,960 458,770
Mail pouch, J. E. Wells. Marbled surfaces, producing, S. C. Madsen. Mechanical motion, Blackie & Nisbet.	458,955 458,764 458,746
Meter. See Electric meter. Water meter. Milk aerating machine, W. Garrett. Milk aerator, I., W. Farr.	458,895 458,692
Milker, cow, S. Amspacker. Mill. See Faming mill. Mill, J. H. Pendleton.	458,611
Mining machine, electric coal, C. J. Van Depoel Moulding machine for moulding plastic mater a J. Hoffman	e. 458,868 d., 458,754
Mortiser, groover, rabbeter, and borer, combine M. P. Brown	d, 458,613
Mower, lawn, D. M. Kyle. Nails, machine for polishing, cleaning, and pacing mine B. H.	458,776 458,715 k-
Nippers, cutting, S. O. Root. Nozzie, variable, A. A. Charonnat.	458,571 458,570 458,763
Nut lock, D. • Ward •ptical measurements, gauge for centerin lenses and making other, A. L. Smith	158,782 19 458,922
Ore washer and concentrator, C. F. Pike •re washer or concentrator, C. F. Pike Packing strip, F. E. Watton	458,958 458,958 458,857
Lock case, W. H. Taylor Lock book, F. Splittstoser McLauchlin. Lubricator, S. Splittstoser Lubricator, A. Monett. Lubricator, A. Monett. Lubricator, A. Monett. Lubricator, A. Monett. Lumber clamp, W. A. Madden Mail bag fastening. C. T. Anderson. Mail bag fastening. C. T. Anderson. Mail book, J. E. Wells. Marbled surfaces, producing, S. C. Madsen Meter. See Electric meter. Water meter. Milk aerating machine, W. Garrett. Milk aerating machine, W. Garrett. Milk aerating machine, W. Garrett. Milk aerating machine, electric cost, C. J. Van Depod Moulding machine, electric cost, C. J. Van	458,914 458,945
Paper, waterproofed parchment, E. Andrews Perambulator, J. Martin Pencil sharpener, J. • Brookhank.	458,840 458,736
Phonograph, E. Oxley. Photographic apparatus, E. W. Perry, Jr	458,916 458,981