inch layer of concrete above, composed of Rosendale verted brick arch of slight curvature, coat it with pitch, lay over it a course of brick, and upon the brick place a layer of from three to six inches of broken stone, and grouted with hydraulic cement and sand and gravel. We think you should use equal parts of sand and cement in making the grout.

(32) J. D. asks whether or not compressed air (say in a wood or iron box) retains the heat which it receives by compression. If so, for what length of will not retain its heat.

(33) F. A. asks: 1. Would the contact of large bodies of iron or steel, or other conductive material, with a telegraph wire interfere with the transmission of messages, provided the wire is not disconnected at any point? A. No, providing the large body were insulated. 2. Could messages be sent through a cylinder three inches diameter, as well as the ordinary wire now in use? A. We think so. 3. Again, has the idea ever been advanced of sending mail matter by means of a very small railway constructed exclusively for that purpose, and carryingneither engineer nor other passenger? Such an engine and boiler without furnace might be made to traverse a single rail at the rate of say be applied for stopping. And boilers for replenishing be located at suitable intervals. A. We are not aware that such a railway has been constructed

(34) W. E. J. asks: Will you please give me a recipe for making the carbons used in batteries for electric light, etc.? A. See reply to query 24, p. 123, of No. 8 of current volume of Scientific American.

(35) J. L. G. writes: I want to construct a Letters Patent of the United States were small, light car to run upon a plank walk. The axle of the driving wheels-which will be about 2% feet in diameter, that is. the wheels-will have two cranks so constructed that when the lever power is dead on one AND EACH BEARING THAT DATE. of the cranks, the other will have all the power applied by the other lever, or to make it more plain, to work on the same principle as the driving wheels of a locomotive. The driving wheels will be attached to the axle in such a manner that they will, when in gear, be propelled by the axle (or only one wheel need be attached to axle in making a turn), and by throwing both wheels out of gear the axle may still continue to be propelled by the engines, but it will have no control over the driving wheels. The car will be about seven feet long. six feet high, two feet wide, and constructed of the lightest material possible, and the total weight, including engineer, will not exceed 275 lbs. Now what I desire most to know is (1) whether two engines, cylinder of 2 inch bore and 4 inch stroke, one boiler, will furnish enough power to propel the car. A. Yes. 2. How many lbs. of steam to the square inch will be required to furnish the two engines with sufficient power to do thework? A. 80 to 90. 3. Doyou think the car will work after it is completed? A. Yes, if properly built.

(36) H. W. B. and F.—You will find good descriptions and drawings of beam engines in Weissenborn's and Moore's works on "American Engineering."

(37) B. F. J. and E. C. ask how to make jet black ink that is shiny and glistening when applied. A. Dissolve in $\frac{1}{2}$ pint of soft water $\frac{2}{3}$ oz. of potassium bichromate, and add the solution to 6 ozs. of ogwood extract dissolved in 1 gallon of water; then dissolve in 1 gallon of water, by continued boiling, borax 6 ozs , shellac 11/2 oz. Mix all together while warm and add ammonia, 3 ozs

How can I temper twist drills? A. Heat them to a cherry red, plunge in cool water, and draw down to a

What solution is best forgiving white deposit in nickel plating, and how made? A. See p. 209, vol. 28, SCIENTI-

Howare lenses placed in a camera obscura? A. If used with a mirror place the surface of the lens the curvawhich has the shorter radii toward the light See p. 212, SCIENTIFIC AMERICAN SUPPLEMENT.

(38) J. W. R.—See reply to B. F. J. and

(39) M. W. C. asks how to make Japan varnish for iron. A A good black japan is made of burnt umber, 4 ozs.; true asphaltum, 2 ozs.; boiled oil. 2 quarts. Dissolve the asphaltum at first in a little oil, using a moderate heat, then add the umber ground in oil, and lastly the rest of the oil, and incorporate thoroughly. Thin with turpentine.

(40) W. L. I. asks: 1. Can 1 produce a continuous electric current under water, having the circuit broken and complete by the revolution of a wheel under water? A. Yes. 2. If so, how can I insulate copper wire for the purpose, so that it may be wound upon a reel about 6 inches in diameter? A. By covering it with gutta percha. 3. What is the strain of an ordinary log on its line, ship sailing 15 knots? Is the electric current upon the bottom of ship strong enough to run a very small mechanical engine? A. We do not know of any experiments upon these points. 4. Also, howcan the area of a screw propeller be found? A. The method, briefly stated, consists in applying one of the rules for determining irregular areas to the devel-

(41) C. K., O. P. R., G. S. F., G. R. W., C. C. S., and others.—Correspondents who sign only initials to their letters should not expect replies. We insist on this rule, as there are inquiries which we prefer to answer by mail.

(42) C. B. asks: 1. Can you give me some information in regard to the process and machinery necessary to make artificial ice? Does it take very expensive apparatus, and where can such be pro-cured? A. Consult articles on this subject on pp. 40, vol. 35, 95, 335, and 168, vol. 37, and 159 and 389, vol. 38, SCIENTIFIC AMERICAN; also pp. 507, 425, 1159, 1348, and 1430. SCIENTIFIC AMERICAN SUPPLEMENT. 2. Could it be 1430, SCIFNTIFIC AMERICAN SUPPLEMENT. 2. Could it be made on a comparatively small scale with any degree of Fan attachment, automatic, G. R. Kress. 206,183 Wantage rod, E. S. Prime 206.259 success? A. Yes, butnot economically.

(43) G. E. B. writes: In Scientific Ameri. | Firearm, breech-loading, H. Borchardt........ can, No. 7, vol. 39, you notice an improvement in elec cement 1 part, gravel and sand 3 parts. A. Make an in-tro-magnets by M. Ernest Bisson, of Paris. 1 made a magnet in the same way five years ago and found it F stronger than common magnets

(44) A. M. W. writes: 1. I have a Bell telephone, and wish to put in circuit the Hughes microphone as a resonator. Will you inform me how it can be done? A. The microphone is used as a transmitter. 2. Would I be allowed to construct a phonograph from your drawings in SUPPLEMENT 133, p. 2112, and use for my own amusement without liability to prosecution for Ga time, considering the box to be airtight? A. The air infringement? A. See editorial entitled "Rights of Investigators," No. 11 of current volume.

> (45) S. V. H.—See reply to 12, in "Notes G and Queries" in No. 11 of current volume.

HINTS TO CORRESPONDENTS.

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

Many of our correspondents make inquirics which cannot properly be answered in these columns. Such inquiries, if signed by initials only, are liable to be cast into the waste basket.

Persons desiring special information which is purely of a personal character, and not of general interest, 11/2 miles per minute. Automatic arrangements could should remit from \$1 to \$5, according to the subject, as we cannot be expected to spend time and lahor to obtain such information without remuneration.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH

Granted in the Week Ending

July 23, 1878,

[Those marked (r) are reissued patents.]

A complete copy of any patent in the annexed list. Including both the specifications and drawings, will be

including both the specifications and drawings, v	will be	Nu
furnished from this office for one dollar. In ord	lering	Or
please state the number and date of the patent de	sired,	Or
and remit to Munn & Co., 37 Park Row, New York	:	Οv
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