- (27) J. R. Y., Jr., asks: Please give me stains on hard finished house walls. A. We do not
- (28) C. D. R. asks: Please give me recipes for making turpentine japan or paint dryer, benzine japan or paint dryer, and rubbing varnish for cabinet makers' use? A. For turpentine dryer, take linseed oil 1 gallon, put into it gum shellac 34 lb., litharge and burntTurkey umber each 1/2 lb., red lead 1/2 lb., sugarof lead 6 ozs. Boil in the oil until all are dissolved, which will require about 4 hours; remove from the fire and stir in 1 gallon spirits of turpentine. For benzine dryer, take linseed oil 5 gallons, add red lead and litharge each 31/2 lbs., raw umber 11/4 lbs., sugar of lead and sulphate fore. When a little cooled, thin with benzine, 5 gallons For rubbing varnish, use a solution of pure, bleached shellac in alcohol, and apply with a smooth wad of cotton cloth, and a drop or two of oil.
- (29) J. H. R. asks: What is the advantage of placing the high pressure cylinder of a marine compoind engine directly above the low pressure cylinder? A. All builders do not adopt this plan. Without being able to speak officially for those who do we imagine that they consider the principal advantages to consist in economy of space and weight.
- (30) W. K. D. says: I have an acquaintance who has an open fireplace in his office, and claims that during the forenoon the sun comes into the room and deadens the fire. Is this true, and what is the cause? A. We do not believe it is true, but probably the effect of deadening is produced to the eye by the sun outshining the fire.
- (31) J. A. C. says: I have a boiler made of first class iron, which commenced leaking in one of the joints. This continued until every joint was leaking. We then patched the seams, but in a short time the leaking commenced again. The water for our boilers was pumped from a well into a tank, and was then warmed by having the exhaust pipe extend into it. Our boiler maker says that the leaking was caused by the oil which was carried from the cylinder by the exhaustpipe into the water in the tank and thence into the boilers. If this is not so, please give me the correct reason? A. You do not send sufficient particulars to enable us to form a decided opinion. The boiler maker's explana-tion points to a possible cause, while it is more likely that the trouble is due to faulty construction, careless management, or to the use of bad water.
- (32) W. E. W. asks: 1. How can I tell the weight of a flywheel where I know the diameter, width of face, and thickness of same? A. Multiply the number of cubic inches in the wheel by 0.2604, to get the approximate weight in lbs. 2. Is there a rule by which the weight of a wheel is regulated for any given horse power? A. No general rule for the size of flywheel will answer under all circumstances. We could not treat the matter satisfactorily in these columns. You will find a good discussion in Rankine's "Machinery and Millwork."
- (33) J. E. C. says: I see it stated in an article on machine belts, in the SCIENCE RECORD for 1876, p. 331, that a belt wrapped one quarter round a pulley ure in answering briefly by mail, if the writer's address has only one fourth the power of what it would have if wrapped one half round. As an illustration of the above is given a man with a rope taking turns round a post, and states what a great power is gained according to the number of turns the rope is taken around the post. I have also known of pulleys being increased in diameter, so as to make the belt stick better and thereby have a greater power. But according to one of the laws of friction increase of surface does not produce increase of friction. How do you account for the power gained in the above cases? A. This is notcontrary to the laws of friction in relation to bodies that are flexible. In these cases, it is shown that the friction depends on the angle of contact. You will find the matter discussed in treat ises on applied mechanics.
- (34) M. A. W. asks: 1. Will a steam boiler 4 feet long by 24 inches diameter, with a firebox 40 inches high, 16 inches wide, and 20 inches long, with 36 one inch flues, be large enough to run an engine with a cylinder, 3 x 6 inches, with 80 lbs. boiler pressure at 200 $\,$ revolutions per minute? A. We think the boiler will answer. 2. Am I correct in estimating said engine at 2 horse power? A. Actual power will not exceed 1 horse 3. Would the above engine run a traction engine with the driving wheels 5 feet in diameter, with gear wheels of 4 revolutions of the driver to one of the driven? What speed could I obtain on moderately good roads? A. With good machinery you might obtain a speed of 3 including both the specifications and drawings, will be contained no novel features.
- (35) C. A. C. asks: 1. How can I varnish a and remit to Munn & Co., 37 Park Row, New York city. colored mechanical drawing, so that the paper and draw ing will not be marred by the operation? A. You must use varnish specially prepared for the purpose, which you can probably obtainfrom some one who mounts show cards. 2. What must be the circumferential velocity of an iron disk (not serrated) to sever a bar of cold iron? A. Between 1 and 2 miles a minute.
- (36) L. M. C. says: I am nineteen years of age, and my ambition is to learn to be a competent practical locomotive engineer. What course would you advise me to pursue in order to obtain that end? A. You should try and get employment as a fireman on a loco-
- 1. Will high pressure steam produce a higher note on a steam whistle than low pressure steam on the same whistle? A. Generally, yes. 2. Will compressed air produce the same note on a steam whistle as steam does. the pressure being alike in both cases? A. The sound is often clearer when air is used. 3. What is the best way to stop foaming in a steam boiler? A. It is often due to the construction of the boiler, or the arrangement of the steam pipe. Sometimes it is caused by dirty water or too strong a fire. The causes will doubtless suggest the remedies.

- (37) J. O. says, in reply to D. W.'s query a recipe for a wash that will remove or hide marks and as to the sudden welding of a mill spindle and its step piece: I have had a similar experience in the uniting of know of anything better than clean water to wash them. hardened steel under excessive friction, due to the ab-Sometimes i is necessary to cover them with kalsomine. sence of lubricant. The foot of a steel pointed shaft, With bad stains over a large surface, it is best to take running at 180 revolutions a minute in a steel step and off the hard finish and renew it carefully in those transmitting some 25 or 30 horse power, brought a water wheel to a sudden stop. The uniting was preceded by a pricking noise, similar to that made by an electric engine. Upon removing the shaft, a ridge of steel taken from the step was found on the foot of the shaft; and no cold chisel or file would make a mark on, and it could only be removed by a grindstone. Hardly any heat was to be felt. I believe the parts welded by wearing of parts to perfect surfaces, and then excessive friction completed the job.
- (38) J. H. P. says, as to the welding of the spindle to the step plate: I think that the end of the spindle had worn a little hollow in the step plate, havof zinc, each ½ lb. Pulverize, and boil in the oil as being the same curvature with itself. The pressure of the end of the spindle upon the bed plate had forced out the air and oil, and the two had come into actual contact, particle with particle, and were, hence, one piece,
 - (39) F. D. H. says: The statement of D.W. as to the welding of a mill spindle point to its step can be verified by three precisely similar cases, which have been brought to us for repairs. He is undoubtedly in error in regard to the point being well oiled. If that were the case, it would indeed be a remarkable occurrence; but when running dry, such things occasionally happen. In every instance that has come under our notice the weld was a perfect one, and defied all efforts to separate the pieces.

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

J. A. S.—It is iron pyrites or sulphide of iron. See p. 7, vol. 36.-W. R. S.-A quantitative analysis of fire clay, etc., would cost about \$15. About 2 lbs. of the material will be required. Send by express.-B. F. T.-It is indurated clay, containing markasite. See p. 7, vol. 35. It is of little value.—H. A. W.—Quantitative analyses cost from \$10 to \$30 each.

COMMUNICATIONS RECEIVED.

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

On the Valuation of Sugar. By S. W. On the Involute of the Circle. By L. D'A. On a Tidal Motor. By A. S.
On City Travel. By T. B. McC.
On American Progress. By
On Fire Escapes. By G. L. B.

Also inquiries and answers from the following: F. B. M.—G. S. B.—P. P. P.—L. S. B.—A. K. B. C. P. R.—J. B. O.

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.

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-

Hundreds of inquiries analogous to the following are sent: "Who makes dynamometers? Where can silkworms' eggs be obtained? Who makes brewers' machinery? Who sells tobacco-flavoring composition? Who sells coffee-roasting machinery?" 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 ob-

OFFICIAL.

INDEX OF INVENTIONS

FOR WHICH

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

April 3, 1877,

AND EACH BEARING THAT DATE.

[Those marked (r) are reissued patents.]

A complete copy of any patent in the annexed list, or 4 miles an hour. Your idea as to reversing an engine furnished from this office for one dollar. In ordering, please state the number and date of the patent desired,

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