Graphite Bushings.—Put them on all loose pulleys.

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Best belt hooks are Talcott's. Providence, R. I.

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NEW BOOKS AND PUBLICATIONS.

SCREW THREADS AND METHODS OF PRODUCING THEM. By Paul N. Hasluck. London: Crosby, Lockwood & Co. 1887. Pp. 79.

In this little work, which as regards form is strictly of vest pocket size, is given a practical treatise on this important subject, adapted for the mechanic. Dies and die stocks, screw cutting on lathes with chasers and on engine lathes, and tap making are all succinctly and clearly treated. The illustrations are numerous; they are fifty in number. Eight tables of Whitworth and other gauges, decimal equivalents, etc., follow. The book may be confidently recommended as a true *vade mecum* to the thinking machinist.

THE PRESERVATION OF FISH. By J. C. Ewart, M.D. London: Charles Griffin & Co. 1887. New York: Scribner & Welford. Pp. ii, 45.

This valuable and interesting little monograph treats of the prevention of putrefaction in fish. The relative keeping qualities of fish caught in different ways, as by trawl or hook, are examined, and conclusions reached as to the best method of catching fish for market. The general conclusions are in favor of the hook. Some remarkable instances of the disregard fish pay to the hook are quoted. Codfish are cited that after being held for three weeks on a set line seemed as lively and happy after the expiration of the period of captivity as ever. The great point seems to be that the fish needs to have unimpeded gill action. As long as his breathing apparatus is untouched, he seems not to mind the hook. Byron's lines about Izaak Walton,

"I wish the cruel old coxcomb in his gullet
Had a hook fixed with a small trout to pull it,"

lose much of their force in the light of the experiences cited by Mr. Ewart. On the whole, the book may be recommended to all fishers as of very general interest and as disclosing a comparitively new line of research.

Notes & Queries

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters, or no attention will be paid thereto. This is for our information, and not for publication.

References to former articles or answers should give date of paper and page or number of question.

Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all, either by letter or in this department, each must take his turn.

Special Written Information on matters of personal rather than general interest cannot be expected without remuneration.

Scientific American Supplements referred to may be had at the office. Price 10 cents each.

Books referred to promptly supplied on receipt of price.

Minerals sent for examination should be distinctly marked or labeled.

(1) H. P., Jr.—For browning gun barrels: Mix 16 parts sweet spirits niter, 12 parts saturated solution of sulphate of iron, 12 parts chloride of antimony. Bottle and cork the mixture for a day, then add 500 parts water, and thoroughly mix. Clean the barrel to a uniform grain free from grease and finger stains. Wipe the barrel with the staining mixture on a wad of cotton. Let it stand for 24 hours, scratch-brush the surface and repeat twice. Rub off the barrel the last time with leather moistened with olive oil. Let it dry for a day and rub down with a cloth moistened with oil to polish. There is an excellent book on gun work, the "Gunsmith's Manual," which we can furnish for $2.

(2) B. H. K. asks addresses of manufacturers of traction engines, for which we refer him to the announcements in our advertising columns.

(3) I. P.—Soundings in the Pacific Ocean have been made to the depth of from 5,000 to 6,000 fathoms. The deepest sounding known was made in the South Atlantic Ocean, being 7,706 fathoms, about 8¾ miles. Iron was used for the sinker; both lead and iron sink rapidly to the greatest depths. The pressure at a depth of 5 miles is 11,000 pounds per square inch.

(4) T. H. writes: I want to fill a cistern with a force pump, a distance or height of nineteen feet. Which will require most pressure—to fill from the bottom or top of cistern, and what is the difference? A. It takes a trifle less power to fill at the bottom, the difference in pressure per square inch being equal to forty-three one-hundredths of a pound for each foot of distance between the surface of the water in the tank and the filling spout at the top of the tank.

(5) W. S. C. asks: What is meant by the crank of an engine being ahead of the steam? A. Crank is ahead of the steam when it passes the center before the steam port opens.

(6) J. C.—You may cast solid Babbitt boxes on an iron spindle turned smooth and with a slight taper. Paint the spindle with whiting and water and heat to thoroughly dry the whiting before inserting in the iron box. Cast, and when cold the spindle will easily drive out. There are machines for repairing valve seats and disks to be had through the machinist supply trade. Make buffing wheels of sole leather. The form of the iron you have to finish should suggest the form of the buff wheel surface.

(7) W. T. P.—Water gauge glasses should not necessarily break oftener after cleaning than otherwise. Iron rods or wire should not be used in cleaning the glasses. Better use a pine stick with a wad of cotton cloth upon the end, not large enough to press the glass, or a string with a wad tied in the middle, so that the wad may be pulled both ways. The peroxide scale on iron rods or wire is hard and liable to make minute scratches upon the inside of the tubes. There is always a strain upon the inside surface from defective annealing, which by the least scratch will cause fracture.

(8) C. M. H.—To compute the centrifugal force of a fly wheel: Divide its velocity in feet per second by 4·01, also square of quotient by diameter of circle. This quotient is the centrifugal force, assuming the weight of the rim as 1. Then this quotient multiplied by the weight of the rim in pounds will give the centrifugal force in pounds. For approximate accuracy the center of the rim may be taken as the point of measurement. Divide the whole centrifugal force by the numbers of arms for the force on each arm, or by the area of all the arms in square inches for the force per square inch in each arm.

(9) H. F. B.—The rubber for band saw wheels should be made in rings and stretched on. You may also wind the rubber in thin strips around the groove with rubber cement. The rubber should be what is called pure gum in the trade. Gum and cement can be procured through the rubber trade. After winding and cementing the strips as a solid piece, and tying the end down, the wheel should be placed in a warm place to dry, for a day or two. Leather is sometimes used when rubber cannot be readily procured. You cannot glue rubber to stand.

(10) I. B. S. writes: In a railway curve say of two miles, the outside rail would be about 150 feet longer than the inside rail; now, how does the locomotive make the above curve, and the outside drivers travel 150 feet more than the inside drivers when the two driving wheels are compelled to make the same number of revolutions? A. The wheels slip on the rails, the slip occurring with the wheels having the least friction as governed by the pull of the engine. As, for instance, when the engine is pulling hard around a curve, the inner wheels slips. When running free with steam shut off, a slight difference in the condition of the rails may make the slip on either side. When two or three pairs of driving wheels are connected, the slip takes place on all alike. With the standard railroad gauge, the difference in the length of the inner and outer rail on a whole circle curve, great or small, will only be about 29½ feet. Very few curves are greater than ⅙ of a circle, which will make only about 44 inch slip for the whole length of a ⅙ circle curve.

(11) C. H. P. writes: I have a well, distant about 300 feet from a stream of water. The bottom of the well is about 10 feet deeper than the stream; the well is used to supply a 15 horse power boiler, but the supply is insufficient. Can I siphon water from the stream? If so, how? A. Provided that you do not have to make the apex of the siphon more than 28 feet above the stream, you can lay the pipe, protected from freezing, from the stream to the highest point. There insert a tee, and continue the pipe to below the surface of the water in the well. Connect the outlet of the tee with the pump. If convenient, place a valve each side of the tee in the main pipe, to control the direction of the supply. Make all air tight, open the valves and pump the air out, when the water from the stream will flow to both pump and well. The pump will always keep the siphon free from air. Use the same size pipe as now used for the well connection.

(12) F. M. P. writes: Is there anything that I can apply to a crank pin bearing of a steam engine to keep it from cutting when it gets hot? The bearing is brass against steel. Also will said bearing have a tendency to wear to an oblong shape? A. Use powdered graphite (black lead) in small quantity, mixed with the oil. The trouble may be due to the poor quality of the oil used. Much of the lubricating oil on the market is unfit for engine bearings. By mixing the best lubricating oil that you can get with sweet lard oil, you will much improve your lubricant, and probably get rid of your trouble. The crank pin has a slight tendency to wear out of round by the unequal pressure and abrasion from heating.

(13) H. M. M. asks how to cook hominy to give it a snow white appearance. A. Use hominy made from white corn only. Boil in a porcelain-lined vessel with water free from iron.

(14) G. H. P.—Naphtha and gasoline are not easily managed in a blowpipe for glass. Use the best lard oil with a wick ¾ inch in diameter. Use a common brass blowpipe fixed to the stand or bench, with a rubber pipe extending down to a tee piece having rubber valves so arranged as to blow with two common house bellows alternately operated by the feet, or you may make a small holder of an India rubber bag with a weight upon it, using only one bellows for filling.

(15) L. P. McC. asks: 1. Is there anything I can apply to the cement coating in my cistern to harden it, or render it so that it will not make the rain water hard? A. Probably your cistern is coated with a poor quality of cement, which is partially soluble in water. There is nothing better than a lining of pure Portland cement. Clean and scrape the walls and bottom of the cistern, and plaster with a thin coat of pure Portland cement. 2. What is the number of asteroids now discovered? A. There are over 260 asteroids known. We have not the complete list to the present time.

(16) D. P. asks about the wages of iron puddlers in and around Pittsburg, and whether any of them receive from $10 to $12 per day. A. Puddlers work hard and get high wages; for a good workman to earn from $4 to $6 in a day is not uncommon, and exceptionally it may go as high for a single day as you mention. 2. Whether there are any coke ovens where coke is manufactured for sale without the gas being utilized. A. Yes; in nearly all of them. 3. Whether coal increases in bulk when transformed into coke. A. The bulk increases 20 to 25 per cent, and weight decreases from 30 to 55 per cent.

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