### NEW BOOKS AND PUBLICATIONS

LOCKWOOD'S DICTIONARY OF TERMS USED IN MECHANICAL ENGINEER-ING. London : Crosby, Lockwood & Son. Pp. 417. Price \$3.

This work does not assume to be a general reference book for terms used in all mechanical branches, but only for such as are directly connected with the practice of engineering, as in the drawing department, pattern shop, and foundry, in the fitting, turning, and smith's shops, and in all kinds of boiler work. The definitions cover some six thousand terms, embracing those in most common use in the workshop, as well as a vast number of technical terms of comparatively recent origin in the science of modern engineering.

PHOTOGRAPHY APPLIED TO SURVEYING By Lieut. Henry A. Reed, U.S. A. New York : John Wiley & Sons. 66 68

pp. quarto, with illustrations. Price \$2.50.

The author claims that, in themselves, photographs present all the data necessary for the construction of an accurate map, thus rendering other field work unnecessary, while at present photographs are only used in the United States as an addenda to the field work. In France, however, photography has been more generally applied to surveying, with a great saving of time and labor. The subject is presented by the author in a plain and concise manner, according to the experience obtained in his own practice, and with reference to the contributions of numerous foreign writers.

- THE WATCH JOBBER'S HANDYBOOK. London: Crosby, Lockwood & Co. Pp. 144. Price 80 cents.
- E WOOD TURNER'S HANDYBOOK. London: Crosby, Lockwood & Co. Pp. 144. Price 80 cents. Тне

These manuals are of a series of handybooks for handicrafts, the first object in all of which is to be practical and elementary, so that they will be of valuable assistance to an apprentice just commencing to learn a trade in either of the departments to which they relate, or to an amateur seeking to do such work for himself. They are very plain and minute in their descriptions of tools and how to use them, are fully illustrated, and afford sufficient information to enable a young man or boy having any facility at mechanical work to do a great many jobs such as would ordinarily be sent to a regular craftsman.

Any of the above books may be purchased through this office. Send for new catalogue just published, Address MUNN & Co., 361 Broadway, New York.



#### 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 This is for our information, and not for publication.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 repit 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.

Wine rais sent for examination should be distinctly marked or labeled.

(I) T. W. V. asks: What is the best kind of material to make cores for steel castings? Cores used for cast iron do not do very well for steel, as the steel being much hotter than cast iron, cuts into the cores and leaves a rough casting. A. Try ground fire brick with the dust blown out. Make the cores in the same way as with sand.

(2) T. G. R. writes: 1. T. H. claims to have a hydrometer which, when suspended in a silver or gold solution, will denote the quantity of metal in said solution. Is there any such hydrometer? I have Baume's hydrometer, but I cannot tell the quantity of metal in a solution with that, and I find, by inquiry, it (Baume's) is generally used by platers around here. A. All hydrometers are based on the same general principle, and usually differ only in graduation. They will not indicate the amount of gold or silver in a plating solution with any approach to accuracy. 2. Silver plated ware is advertised as single, double, triple, and quadruple plate, now what is the definition of above terms. Is there a given weight of the metal deposited on a given surface to denote each term? A. As used in this country, they are simply arbitrary terms, not denoting absolute, but only comparative weight of metal deposited, the double plate of some manufacturers equalmg the triple plate of others, etc. 3. What is the weight of a gramme in Troy weight? A. A gramme is equal to 15:43235 grains. 4. In a great many mechanical as well as electrical calculations I meet with, letters are used which I cannot understand. How are such calculations made? A. You will have to study the subject of electricity from the beginning. We recommend Watt's Electro-Deposition, which we can send you by mail for \$3.50. (3) H. G. H. writes: 1. At sunset we see a band of stratus clouds in the west, seeming to rest upon the horizon. Howfar distant from the point of observation is the place where those clouds are directly overhead? A. Stratus clouds are variable in height. Generally low in winter and higher in summer. Their height may be from 800 to 5,000 feet. Clouds 800 feethigh may be seen on the horizon at 36 miles distance. At 2,000 feet high they may be seen 50 or more miles, and at 3,000 feet 70 miles. 2. What is the average height above the earth's surface of the approaching storm cloud, as we see it creeping up from

cumulus? Of the cirrus? A. Thunderstorm clouds are very variable in height-500 to 2,000 feet. The clouds in thunder storms may be very deep, two to five miles, and more. Hence the appearance as to distance is very deceptive. Cumulus clouds are intermediate, and generally occupy a position from 2,000 to 5,000 feet above the earth. Cirrus clouds are the highest, and are from 10,000 to 30,000 feet above the earth. 3. What rule may be given for finding the distance of clouds from the place of observation, when their angular distance above the horizon and their approximate height above the earth's surface are known? A. Calculations for the distance and height of clouds are very uncertain, from the difficulty of obtaining correct observations; simultaneous trigonometrical triangulation from a known base, and computation, are the only method of determining the distance.

(4) A. S. B. writes: 1. If, in making a dynamo after the plans of the motor in SUPPLEMENT, No. 641, I wind the armature with No. 24 wire and the field magnet with No. 16. about how many pounds of each will I need? Are these the right size of wire? A. We think the sizes of wire are about right. You will require about 3 pounds of each kind of wire. 2. What is the reason of using cast iron for the field magnet? A. Because cast iron retains sufficient magnetism for starting. 3. I made a galvanometer of a 11/2 inch compass placed over 30 feet of No. 24 wire. When connected with a cell of gravity battery, it was deflected about 95°. I read that a galvanometer was never deflected more than 90°. Is this wrong? A. We think you are mistaken about the deflection of 95°. 4. I made a bichromate battery of two pairs of electric light carbons with a zinc 2 inch by 1 inch. How strong would one cell be? A. Probably 11/2 volts. 5. Must the resistance of the wire on the field magnet equal the resistance of the wire on armature on a motor or dynamo? A. Not necessarily.

(5) R. W. writes: I have made a dynamo according to the directions in SUPPLEMENT, No. 161, only I used No. 26 wire instead of No. 18, as recommended in the paper. It works well enough, could it be made to work better by using No. 18 wire? A. It depends entirely upon the use to which you apply the dynamo. No. 18 wire on the armature will give a current of fewer volts, but more amperes. 2. How could I change it to electroplate? A. Wind the armature with No. 10 wire, and the field magnet with No 14. 3. J am also making an eight light dynamo according to directions in a previous number of your paper, but I have used vulcanized fiber between the commutator bars instead of mica. Will the spark burn it out or not? A. Mica is preferable, as vulcanized fiber is apt to burn. 4. I see in the cut of the complete machine that all of the magnet terminals are connected to what seems a switch board. Does this mean, that if the current is shunted through one pair of coils on the field magnet. that the machine generates current enough for two lamps, and so on? Until four are shunted in circuit the machine runs to its full capacity of eight lamps. A. The part you take for a switch is only a support for the wire. By connecting all the wires in series and using the machine as a shunt machine, with some added resistance in the shunt, you will be able to run from one to eight lamps.

(6) W. H. L. desires a good remedy for moths in furniture. A. The continual use of Persian insect powder will drive them away. The noxious principle of the powder, however, soon evaporates, so that its frequent renewal is necessary until all of the moths are killed.

(7) W. R. K. asks if there is any known compound, which will, without material injury, aid in the rapid growth of hair on a young man's face? A. Mixtures containing stimulants, such as cantharides or Spanish fly, are said to be somewhat efficacious, if persistently applied in moderate quantities for a considerable period. Among the mixtures recommended forthat purpose is: Cologne 2 ounces, liquid ammonia 1 drachm, tincture cantharides 2 drachms, oil rosemary 12 drops, lavender 12 drops. Apply to the face daily. (8) F. T. H. asks: 1. What vehicle should powdered soapstone be mixed with, when brick outside walls are to be painted ? A. Boil with linseed oil and a small quantity of resin. 2. What to mix it with when iron work is to be painted? A. Linseed oil. 3. Also please explain why, when a 1/2 inch glass tube is introduced into water, the water level in the tube is always about an eighth of an inch above the normal level? A. On account of capillarity, for a description of which see Sir William Thomson's lecture in the Scientific American Supplement, Nos. 562. 563, which we can send you for ten cents each. 4. Inrunningelectric, wires through gas mains, is there any insulation in the market that will effectually resist the chemicals usually found in gas mains? A. A wire insulated and coated with lead over the insulation would be most effectual. Most other styles would quickly or slowly deteriorate.

(9) F. L. D. asks the power required to drive a 30 foot boat at a spe of 12 miles p hour. is built on what is known as the "skip jack " model, is 8 feet beam and 33 inches flat on bottom. It was built by an experienced boatman, and cuts the watervery smoothly. A. It is extremely doubtful if you can a commodate engine, boiler, and wheels of sufficient size to drive your boat 12 miles per hour. We do not know how much draught nor the kind of wheel you propose. A 6 x 12 cylinder with 8 horse power boiler, carrying steam at 100 pounds pressure, connected direct to a stern wheel 8 feet diameter, will realize 10 miles per hour at 50 revolutions per minute. (10) J. R. B. writes: 1. I have an ivory rule which has become yellow from age. Is there any way to restore it white again, without injury? A Place for a short time in a gently heated thin lime paste. 2. Do spoke manufacturers use good glue alone on their sand belts, or do they put something in to make it elastic? A. Common brown glue is betterthan the best glue, and will answer alone.

the horizon before a thunder or rain storm? Of the face before taking the picture. 2. What oil should be applied to shoes to make them more flexible, impervious to water, and durable? A. Use neat's foot oil moderately and well rubbed in after the leather has been sponged off, and while it is still damp. 3. Where is a good place for buying chemicals and scientific apparatus for amateur experiments in the home circle? A. Consult our advertising columns.

> (12) W. H. D. desires a recipe for a first ass office mucilage. A. Use the following prepara tion: Gum dextrin 2 parts, water 5 parts, acetic acid 1 part; dissolve by heat and add 1 part of alcohol.

(13) C. D. A. desires directions for moulding small articles of soft rubber. A. The process is analogous to that described under "The Making of Rubber Stamps," in SCIENTIFIC AMERICAN SUPPLE MENT, No. 569. See also the series of articles giving very full details on the manufacture of rubber in Scr ENTIFIC AMERICAN SUPPLEMENT, Nos. 249, 251, and

(14) L. J. J. asks what the common der used for fishing is made of? A. Silk worms are broken in two and drawn apart, and the silk-forming matter, which is pulled out into a thread between the eces, hardens in the air, and forms the so-called two p gut " leaders.

(15) W. S. asks (1) how breaking strain on suspension bridge cables is computed. A. The strains are generally computed on the assumption that the curve is a parabola. 2. What cheap and effective way to destroy or drive small red or brown ants from and around the house? A. Try a good insect powder. 3. What is your charge for assaying ores for gold and silver, etc., also for analysis of ores? A. From five dollars upward.

(16) H. & W. ask: 1. What is the best walnut stain? A. Take of spirits of turpentine 1 gallon, pulverized asphaltum 2 pounds, dissolve in an iron kettle on a stove, stirring constantly. Can be used over a red stain to imitate rosewood. The addition of a little varnish with the turpentine improves it. 2. What is the best preparation, and how made, for putting on the strings used in sealing fruit jars, etc.? A. Dissolve one pound of sulphate of zinc in 40 gallons of water, and then add 1 pound of sal soda. After these ingredients are dissolved, add 2 ounces tartaric acid. The cord should be soaked in this solution for twenty-four hours and then dried without wringing.

(17) A. M. M. writes: 1. I have a small rule madeof bone, which I broke. Is there a cement that will mend it? A. Take of isinglass 1 ounce, distilled water 6 ounces. boil to three ounces, and add rectified spirit 11/2 ounces, boil for a minute or two, strain, and add while hot, first a milky emulsion of gum ammoniac 16 ounce, and then tincture of mastic 5 drachms. 2. Which will give the most heat, a gallon of gasoline or a gallon of kerosene, for steam boilers? Which would be the safest to burn? A. Kerosene is the safer, and will give most heat.

(18) A. G. and others ask : When does the next century begin? Some claim that is January 1, 1900, while I claim that it commences on Kanuary 1, 1901. A. It commences January 1, 1900. The Opristian era was not promulgated until long after the birth of Christ, the Roman calendar being then used-its buginning being assigned as the first of January, in the fourth year of the 194th Olympiad, the 753d from the foundation of Rome, and the 4,713th of the Julian period. By the computations of several authors, the date of the birth of Christ varies several years before and after the assigned date of the Christian era.

(19) H. W. D. asks (1) if the coil described in SUPPLEMENT, No. 160, is wound with No. 35 instead of No. 36 wire, will it do just as well, and what size spark should it give? A. The increase in the size of the wire is so slight as to make no material difference in the action of the coil. 2. If I should make a coil the size of the figures instead of twice the size, wound with No. 36, what size spark will it give? If coil is made as in question 2, but wrapped with No. 35 instead of No. 36, what size spark will it give? A. From X inch to % inch. 3. What is cartridge paper? A. Heavy, highly calendered manila paper.

(20) T. W. asks for some metal or alloy that will neither expand nor contract with heat or cold. And which metal expands most with heat, and the amount of expansion in a piece of the same metal ten feet long? A. No such metal is known. The condition is obtained by a combination of metals in the gridiron pendulum. Of common metals zinc expands the most; between freezing and boiling temperatures, 32° and 212° Fah., it expands 1 of its length-about 100 inch for a piece 10 feet long.

(21) B. J. H. asks : What is the simplest method for finding the altitude of a given place? Is a barometer used? And if so, where can the same be obtained? A. The mercurial harometer may be used with reasonable accuracy, or a line of levels may be rnn with still greater exactness. Any dealer in scientific instruments can supply you with desired requi-

#### TO INVENTORS.

An experience of forty years, and the preparation of nore than one hundred thousand applications for patents at home and abroad, enable us to understand the laws and practice on both continents, and to possess un equaled facilities for procuring patents everywhere. synopsis of the patent laws of the United States and all foreign countries may be had on application, and persons contemplating the securing of patents, either at home or abroad, are invited to write to this office for prices. bich are low, in accordance with the times and our exbuilties for conducting the business. Address MUNN & CO., office SCIENTIFIC AMERICAN, 361 Broadway, New York.

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# June 5, 1888,

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<ul> <li>Brick klin, W. &amp; S. H. Alsip</li></ul>	383,936 383,967 383,890 383,897 383,898 383,903 384,007 384,019 384,019 384,019 384,104 383,881 384,192 384,194 383,881 384,192 384,194 383,904 384,018 384,018
Brick klin, W. & S. H. Alsip. Brick or tile for building purposes, W. J. Pringle. Bridge, W. Harman. Bridge, W. Harman. Bridge, metallic, M. L. E. Duval. Burner. See Hydrocarbon burner. Burners for incandescent lighting and making the same, stock for skeleton, E. Moreau. Bustle, H. P. Olmstead. Button, W. F. Niles. Button fastener, Clark & Ingraham. Button fastener, Clark & Ingraham. Button fastener, Clark & Ingraham. Button manufacturing machine, G. Heidmann et al. Buttons, etc., making, S. Cottle. Buttons, etc., making, S. Cottle. Can filing machine, G. H. Perkins. Cans with oils and other liquids, box for filling, G. H. Perkins. Car coupling, W. R. Chadsey. Car coupling, J. Coup.	383,996 383,967 383,980 384,197 363,871 383,896 383,906 384,064 384,019 384,064 384,019 384,019 384,164 384,29 384,19 384
<ul> <li>Brick klin, W. &amp; S. H. Alsip.</li> <li>Brick or tile for building purposes, W. J. Pringle.</li> <li>Bridge, W. Harman.</li> <li>Bridge, W. Harman.</li> <li>Bridge, metallic, M. L. E. Duval.</li> <li>Burfer for housekeeping, A. L. Dey.</li> <li>Burner. See Hydrocarbon burner.</li> <li>Burner for incandescent lighting and making the same, stock for skeleton, E. Moreau.</li> <li>Bustle, H. P. Oimstead.</li> <li>Button, W. F. Niles.</li> <li>Button fastener, Clark &amp; Ingraham.</li> <li>Button manufacturing machine, G. Heldmann et al.</li> <li>Buttons, making, S. Cottle.</li> <li>Buttons, etc., making, S. Cottle.</li> <li>Can built oils and other liquids, box for filling, G. H. Perkins.</li> <li>Car coupling, J. Coup.</li> <li>Car coupling, J. Coup.</li> <li>Car second and the second se</li></ul>	383,996 383,967 383,890 384,197 363,871 383,896 384,903 384,019 384,019 384,019 384,164 383,881 384,122 383,981 383,981 383,991 383,904 383,904 383,904 383,904 383,904 383,904 383,904 383,904 383,904 383,904 383,904 383,904 383,904 383,904 383,905 384,019 383,904 383,905 384,019 383,905 384,019 383,910 383,91
Brick klin, W. & S. H. Alsip Brick or tile for building purposes, W. J. Pringle. Bridge, W. Harman Bridge, W. Harman Bridge, metallic, M. L. E. Duval	383,996 383,997 383,890 384,197 383,871 383,871 383,903 384,007 384,019 384,019 384,019 384,164 383,881 384,192 384,114 383,881 384,123 384,124 383,901 383,901 384,911 383,991
Brick klin, W. & S. H. Alsip. Brick klin, W. & S. H. Alsip. Bridge, W. Harman. Bridge, W. Harman. Bridge, W. Harman. Bridge, metallic, M. L. E. Duval. Burner. See Hydrocarbon burner. Burners for incandescent lighting and making the same, stock for skeleton, E. Moreau. Bustle, H. P. Olmstead. Button, W. F. Niles. Button, M. F. Niles. Button fastener, Clark & Ingraham. Button hole cutter, J. R. Hopkins. Button manufacturing machine, G. Heldmann et al. Buttons, making, S. Cottle. Cable and car propeller, elevated, H. Casebolt. Can filing machine, G. H. Perkins. Car swith oils and other liquids, box for filling, G. H. Perkins. Car coupling, W. R. Chadsey. Car coupling, W. R. Chadsey. Car coupling, M. Robbins. Car coupling, G. M. Robbins. Car coupling, G. M. Robbins.	383,936 383,967 383,987 383,880 384,197 363,871 383,886 384,064 384,064 384,064 384,064 384,018 384,164 383,881 384,283 384,124 383,981 383,991 384,018 384,193 384,193 384,217 384,017
Brick klin, W. & S. H. Alsip Brick or tile for building purposes, W. J. Pringle. Bridge, W. Harman Bridge, W. Harman Bridge, metallic, M. L. E. Duval Burner. See Hydrocarbon burner. Burners for incandescent lighting and making the same, stock for skeleton, E. Moreau Bustle, H. P. Olmstead Button, W. F. Niles Button fastener, Clark & Ingraham Button fastener, Clark & Ingraham Button fastener, Clark & Ingraham Button manufacturing machine, G. Heldmann et al Cable and car propeller, elevated, H. Casebolt Can suith oils and other liquids, box for filling, G. H. Perkins Car coupling, J. Coup Car coupling, J. Coup Car coupling, J. Coup Car coupling, W. R. Robbins Car coupling, W. R. Robbins Car coupling, W. O. Rutledge Car coupling, W. O. Rutledge Car heater, F. C. McElroy Car baken, gamma streat. M. Claszo	383,936 383,967 383,980 384,197 363,871 383,898 384,064 384,007 384,019 384,164 384,103 384,164 383,881 384,225 384,124 383,981 383,970 384,112 383,970 383,970 383,971 383,971 383,971 383,971 383,971 383,971 383,971 383,971 383,971 383,971 383,971 383,971 383,971 383,971 383,971 384,127 384,128 383,971 383,971 383,971 383,971 383,971 383,971 384,127 384,075 384,075
Brick klin, W. & S. H. Alsip Brick or tile for building purposes, W. J. Pringle. Bridge, W. Harman Bridge, W. Harman Burdge, W. Harman Burdge, we harman Burner. See Hydrocarbon burner. Burner for incandescent lighting and making the same, stock for skeleton, E. Moreau Bustle, H. P. Olmstead Button, W. F. Niles Button, W. F. Niles Button fastener, Clark & Ingraham Button hastener, Clark & Ingraham Button manufacturing machine, G. Heldmann et al. Buttons, etc., making, S. Cottle Cable and car propeller, elevated, H. Casebolt Can swith oils and other liquids, box for filling, G. H. Perkins Car coupling, J. Coup Car coupling, J. Coup Car coupling, G. M. Robbins Car baker, F. C. McElroy. Car heater, F. C. McElroy. Car heater, F. C. McElroy.	383,936 383,967 383,980 384,197 363,871 383,876 384,907 384,019 384,019 384,019 384,019 384,019 384,164 383,881 384,129 383,91 383,904 384,018 383,174 383,91 383,174 383,91 383,174
Brick klin, W. & S. H. Alsip. Brick or tile for building purposes, W. J. Pringle. Bridge, W. Harman Bridge, W. Harman Bridge, metallic, M. L. E. Duval	383,936 383,967 383,890 384,197 363,871 383,886 384,064 384,064 384,064 384,064 384,064 384,064 384,064 384,064 384,106 384,164 383,81 384,126 384,126 383,971 384,107 384,100
<ul> <li>Brick klin, W. &amp; S. H. Alsip</li></ul>	383,936 383,967 383,980 384,197 363,871 383,886 383,986 383,986 384,064 384,019 384,164 384,019 384,164 383,881 384,225 384,184 384,217 384,193 383,940 383,940 383,951 384,151 384,151 384,151 384,151
<ul> <li>Brick klin, W. &amp; S. H. Alsip</li></ul>	383,936 383,967 383,980 384,197 363,871 383,876 384,903 384,019 384,007 384,019 384,019 384,102 384,124 383,881 384,122 383,971 383,901 383,901 383,2174 383,91 383,2174 383,91 383,2174 383,91 383,2174 383,91 383,2174 384,126 384,126 384,12755 384,12755 384,127555555555555555555555555555555555555
Brick klin, W. & S. H. Alsip. Brick kortile for building purposes, W. J. Pringle. Bridge, W. Harman Bridge, W. Harman Bridge, metallic, M. L. E. Duval	383,936 383,967 383,850 384,197 363,871 383,886 384,064 384,064 384,064 384,064 384,064 384,064 384,064 384,064 384,07 384,164 383,174 383,174 383,979 384,217 383,991 384,217 384,125 384,128 384,128 384,111 384,184
Brick klin, W. & S. H. Alsip. Brick or tile for building purposes, W. J. Pringle. Bridge, W. Harman. Bridge, W. Harman. Bridge, metallic, M. L. E. Duval. Burner. See Hydrocarbon burner. Burners for incandescent lighting and making the same, stock for skeleton, E. Moreau. Bustle, H. P. Olmstead. Button, W. F. Niles. Button fastener, Clark & Ingraham. Button fastener, Clark & Ingraham. Button bole euter, J. R. Hopkins. Button manufacturing machine, G. Heidmann et al. Buttons, making, S. Cottle. Buttons, etc., making, S. Cottle. Can filing machine, G. H. Perkins. Can swith oils and other liquids, box for filling, G. H. Perkins. Car coupling, J. Coup. Car coupling, J. Coup. Car coupling, W. R. Chadsey. Car coupling, W. O. Rutledge. Car heater, F. C. McElroy. Car and gapparatus, street, M. Cleave. Car motor, street, L. B. Gibson. Car ventilator, W. Wright. Car wheel, H. R. Allen.	383,936 383,967 383,980 384,197 363,871 383,886 383,986 384,064 384,019 384,064 384,019 384,019 384,019 384,019 384,019 384,019 384,123 384,123 384,123 383,991 383,991 383,991 383,919 383,921 383,931 384,133 384,133 384,133 384,133 384,133 384,133 384,134 384,134 384,134 384,134 384,134 384,134 384,134 384,134 384,134 384,134 384,134 384,134
Brick klin, W. & S. H. Alsip Brick or tile for building purposes, W. J. Pringle. Bridge, W. Harman Bridge, W. Harman Burdge, W. Harman Burdge, W. Harman Burner. See Hydrocarbon burner. Burners for incandescent lighting and making the same, stock for skeleton, E. Moreau Bustle, H. P. Oinstead Button, W. F. Niles Button, W. F. Niles Button fastener, Clark & Ingraham Button fastener, Clark & Ingraham Button fastener, Clark & Ingraham Button manufacturing machine, G. Heldmann et al. Buttons, making, S. Cottle Cable and car propeller, elevated, H. Casebolt Can filling machine, G. H. Perkins Car brake, G. B. Quigg. Car coupling, J. Coup Car coupling, W. R. Chadeey Car coupling, W. R. Chadeey Car coupling, W. R. Chadeey Car coupling, W. R. Chadeey Car heating apparatus, street, M. Cleave Car heating apparatus, street, M. Cleave Car unloader, H. M. Barnhart Car wheel, H. R. Allen Car wheel, W. G. Richards Car wheel, W. G. Richards Car wheel, W. G. Richards Car wheel, W. G. Richards	383,936 383,967 383,860 384,197 363,871 383,876 384,037 384,047 384,007 384,019 384,164 384,192 384,192 384,192 384,192 384,192 384,193 383,971 383,971 383,971 383,971 383,174 383,971 383,174 383,971 383,174 383,291 383,174 383,291 384,112 384,125 384,112 384,113 384,113 384,113 384,115 384,115 384,115 384,115 384,115 383,546 383,546
Brick klin, W. & S. H. Alsip. Brick or tile for building purposes, W. J. Pringle. Bridge, W. Harman. Bridge, W. Harman. Bridge, metallic, M. L. E. Duval. Burger. See Hydrocarbon burner. Burners for incandescent lighting and making the same, stock for skeleton, E. Moreau. Bustle, H. P. Olmstead. Button, W. F. Niles. Button, H. Vollmer. Button fastener, Clark & Ingraham. Button hastener, Clark & Ingraham. Button manufacturing machine, G. Heldmann et al. Buttons, making, S. Cottle. Cable and car propeller, elevated, H. Casebolt. Can filling machine, G. H. Perkins. Cans with oils and other liquids, box for filling, G. H. Perkins. Car coupling, W. R. Chadsey. Car coupling, W. R. Chadsey. Car coupling, G. M. Robbins. Car coupling, G. M. Robbins. Car steer, F. C. McElroy. Car motor, street, L. B. Gibson. Car wentiator, W. Wright. Car wheel, H. B. Allen. Carwheel, H. R. Allen. Cars frame for railway, M. A. Zurcher.	383,936 383,967 383,850 384,197 363,871 383,886 383,986 383,986 384,064 384,064 384,064 384,064 384,064 384,064 384,064 384,07 384,105 384,128 384,128 383,970 384,155 384,112 384,113 384,112 384,113 384,114 383,989 384,225
Brick klin, W. & S. H. Alsip. Brick or tile for building purposes, W. J. Pringle. Bridge, W. Harman. Bridge, W. Harman. Bridge, metallic, M. L. E. Duval. Burner. See Hydrocarbon burner. Burners for incandescent lighting and making the same, stock for skeleton, E. Moreau. Bustle, H. P. Olmstead. Button, W. F. Niles. Button fastener, Clark & Ingraham. Button fastener, Clark & Ingraham. Button ble cutter, J. R. Hopkins. Button manufacturing machine, G. Heidmann et al. Buttons, making, S. Cottle. Buttons, making, S. Cottle. Cable and car propeller, elevated, H. Casebolt. Can filing machine, G. H. Perkins. Car coupling, W. R. Chadsey. Car coupling, W. R. Chadsey. Car coupling, G. M. Robbins. Car coupling, G. M. Robbins. Car torake, F. C. McElroy. Car ander, H. M. Barnhart. Car wheel, H. S. Hale. Car wheel, H. R. Allen. Car wheel, W. G. Richards. Car strake, W. Guthed. Car wheel, H. R. Allen. Car wheel, M. R. Alson. Car strake, W. G. Buthers. Car wheel, M. Barnhart. Car wheel, M. R. Allen. Car wheel, M. R. Allen. Car strake, W. G. Buthers. Car hatter, F. C. McElroy. Car wheel, H. S. Hale. Car wheel, H. R. Allen. Car wheel, M. G. Richards. Car strake, W. G. Buthers. Car hatter, W. G. Buthers. Car hatter, W. G. Buthers. Car wheel, M. G. Buthers. Car hatter, M. Barnhart. Car hatter, M. Sathers. Car hatter and the sathers. Ca	383,936 383,967 383,980 384,197 363,571 383,886 383,986 383,986 384,064 384,019 384,064 384,019 384,064 384,019 384,014 383,881 384,225 384,124 383,991 384,124 383,991 384,124 383,991 384,124 383,991 384,124 383,991 384,125 384,124 384,113 384,114 384,114 384,115 384,125 384,126
Brick klin, W. & S. H. Alsip Brick or tile for building purposes, W. J. Pringle. Bridge, W. Harman Bridge, we Harman Bridge, metallic, M. L. E. Duval Burner. See Hydrocarbon burner. Burners for incandescent lighting and making the same, stock for skeleton, E. Moreau Bustle, H. P. Olmstead. Button, W. F. Niles Button fastener, Clark & Ingraham Button fastener, Clark & Ingraham Button fastener, Clark & Ingraham Button fastener, Clark & Ingraham Button manufacturing machine, G. Heldmann et al. Buttons, making, S. Cottle Cable and car propeller, elevated, H. Casebolt Can filling machine, G. H. Perkins Car burkins Car brake, G. B. Quigg. Car coupling, J. Coup Car coupling, J. Coup Car coupling, W. R. Chadeey Car coupling, W. R. Robbins Car beater, F. C. McElroy. Car coupling, W. O. Rutledge Car heating apparatus, street, M. Cleave Car brake, H. B. Hale Car wheel, H. M. Barnhart Car wheel, H. R. Allen Car wheel, H. R. Allen Car wheel, H. R. Allen Car coupling, H. S. Hale Car wheel, W. G. Bichards Car basen, H. S. Hale Car wheel, W. G. Bichards Car basen, H. S. Hale Car wheel, H. R. Allen Car wheel, W. G. Bichards Car basen, H. S. Hale Car wheel, H. R. Allen Car wheel, M. Barnhart Car wheel, M. G. Bichards Carentiator, W. Wright Car basen, H. S. Halex Carpt fastener, G. Barrow Cartis fastener, G. Barrow Cartis fastener, G. Barrow	383,936 383,967 383,980 384,197 363,871 383,880 384,064 384,007 384,019 384,164 384,102 384,164 384,102 384,102 384,112 384,124 383,961 384,128 384,128 384,128 384,121 384,121 384,121 384,121 384,125 384,125 384,125 384,125 384,125 384,125 384,125 384,125 384,125 384,125 384,125 384,126 384,126 384,126 384,127 384,126 384,127 384,126 384,226 384,26
Brick klin, W. & S. H. Alsip. Brick or tile for building purposes, W. J. Pringle. Bridge, W. Harman Bridge, W. Harman Bridge, metallic, M. L. E. Duval	383,936 383,967 383,84,197 363,871 383,886 384,197 363,871 383,886 384,064 384,017 384,064 384,018 384,164 383,881 384,225 384,124 383,941 383,941 383,941 383,941 384,125 384,125 384,125 384,124 384,111 384,125 384,125 384,124 384,112 384,125 384,124 384,125 384,125 384,124 384,125 384,255 384
Brick klin, W. & S. H. Alsip. Brick or tile for building purposes, W. J. Pringle. Bridge, W. Harman. Bridge, W. Harman. Bridge, metallic, M. L. E. Duval. Burner. See Hydrocarbon burner. Burners for incandescent lighting and making the same, stock for skeleton, E. Moreau. Bustle, H. P. Olmstead. Button, W. F. Niles. Button, M. F. Niles. Button fastener, Clark & Ingraham. Button bele cutter, J. R. Hopkins. Button manufacturing machine, G. Heldmann et al. Buttons, making, S. Cottle. Buttons, making, S. Cottle. Cable and car propeller, elevated, H. Casebolt. Can filing machine, G. H. Perkins. Car swith oils and other liquids, box for filling, G. H. Perkins. Car coupling, W. R. Chadsey. Car coupling, G. M. Robbins. Car coupling, G. M. Robbins. Car ander, F. C. McBiroy. Car ander, F. C. McBiroy. Car wheel, H. S. Hale. Car wheel, H. S. Hale. Car wheel, H. R. Allen. Car wheel, W. G. Richards. Cars, frame for railway, M. A. Zurcher. Cartage bow, J. B. Fox. Carriage top, M. D. Taylor. Carcing top. M. D. Taylor.	383,936 383,967 383,980 383,980 383,980 383,981 383,984 384,064 384,064 384,064 384,064 384,064 384,064 384,064 384,016 384,114 383,881 384,217 384,018 383,991 383,991 384,217 384,018 384,124 383,991 384,125 384,125 384,125 384,126 383,971 384,126 383,971 384,126 383,971 384,126 383,971 384,126 383,971 384,126 383,971 384,126 383,971 384,126 383,971 384,126 383,971 384,126 383,971 384,126 383,971 384,126 383,971 384,126 383,971 384,126 383,971 384,126 383,971 384,126 383,971 384,126 383,971 384,126 383,971 384,126 383,971 384,126 384,225 384,225 384,225 384,225 384,225 384,225 384,225 384,225
Brick klin, W. & S. H. Alsip Brick or tile for building purposes, W. J. Pringle. Bridge, W. Harman Bridge, metallic, M. L. E. Duval	383,936 383,967 383,980 384,197 363,871 383,880 384,054 384,019 384,164 383,881 384,024 384,019 384,164 383,881 384,225 384,124 383,981 384,123 384,124 383,991 384,124 383,991 384,124 383,917 384,124 383,917 384,125 384,125 384,125 384,125 384,125 384,125 384,125 384,125 384,124 383,949 384,125 384,124 383,949 384,125 384,124 383,949 384,125 384,124 384,124 384,124 384,124 384,124 384,124 384,124 384,124 384,125 384,124 384,124 384,124 384,124 384,124 384,124 384,124 384,124 384,124 384,124 384,124 384,124 384,125 384,124 384,124 384,124 384,124 384,124 384,124 384,124 384,124 384,124 384,124 384,124 384,124 384,124 383,949 384,124 383,940 384,124 384,124 383,940 384,124 384,225 384,25
Brick klin, W. & S. H. Alsip Brick or tile for building purposes, W. J. Pringle. Bridge, W. Harman Bridge, W. Harman Burdge, W. Harman Burner. See Hydrocarbon burner. Burner. See Hydrocarbon burner. Burner for incandescent lighting and making the same, stock for skeleton, E. Moreau Bustle, H. P. Oinstead Button, W. F. Niles Button fastener, Clark & Ingraham Button fastener, Clark & Ingraham Button fastener, Clark & Ingraham Button manufacturing machine, G. Heldmann et al. Buttons, etc., making, S. Cottle Cable and car propeller, elevated, H. Casebolt Can filling machine, G. H. Perkins Car brake, G. B. Quigg Car coupling, J. Coup Car coupling, W. R. Chadsey Car coupling, W. R. Chadsey Car coupling, W. R. Chadsey Car coupling, W. R. Chadsey Car heater, F. C. McElroy Car heater, F. C. McElroy Car heater, S. C. McElroy Car wheel, H. S. Hale Car wheel, H. S. Hale Car wheel, H. R. Allen Car heater, G. B. Ruight Car wheel, H. R. Allen Car heater, G. Barow Car heater, F. C. McElroy Car heater, F. C. McElroy Car heater, S. Hale Car wheel, W. G. Richards Cars frame for railway, M. A. Zurcher Cartinge bow, J. B. Fox Carriage bow, J. B. Fox Carriage bow, J. B. Fox Carriage bow, J. B. Fox Cartridge loading machine, G. M. Peters Cartridge loading machine, G. M. Peters	383,936 383,967 383,870 384,197 363,871 383,876 384,007 384,019 384,164 384,007 384,019 384,164 383,811 384,225 384,124 383,901 384,121 383,901 384,123 384,124 383,91 383,174 383,91 384,123 384,124 384,125 384,225 384,215 384,225 384,215 384,215 384,225 384,215 384,225 384,215 384,225 384,215 384,225 384,225 384,215 384,225
Brick klin, W. & S. H. Alsip. Brick or tile for building purposes, W. J. Pringle. Bridge, W. Harman. Bridge, W. Harman. Bridge, metallic, M. L. E. Duval. Burner. See Hydrocarbon burner. Burners for incandescent lighting and making the same, stock for skeleton, E. Moreau. Bustle, H. P. Olmstead. Button, W. F. Niles. Button, M. F. Niles. Button fastener, Clark & Ingraham. Button manufacturing machine, G. Heldmann et al. Buttons, making, S. Cottle. Buttons, making, S. Cottle. Cable and car propeller, elevated, H. Casebolt. Can filling machine, G. H. Perkins. Cars with oils and other liquids, box for filling, G. H. Perkins. Car coupling, W. R. Chadsey. Car coupling, W. R. Chadsey. Car coupling, G. M. Robbins. Car ator, F. C. McBiroy. Car ator, S. Challedre. Car hotor, street, L. B. Gibson. Sat, J. C. McBiroy. Car wheel, H. S. Hale. Car wheel, H. R. Allen. Car wheel, H. R. Allen. Car wheel, W. G. Richards. Cars frame for railway, M. A. Zurcher. Cardhanger, H. S. Hale. Car caring bow, J. B. Fox. Carriage bow, J. B. Fox. Cartinge loading machine, G. M. Petters. Cartinge loading machine, G. M. Petters. Carthale, W. D. Taylor. Cardhanger, H. S. Hale. Cartinge loading machine, G. M. Petters. Cartinge loading machine, G. M. Petters. Cartinge loading machine, P. Selby. Cartinge loading machine, P. Selby. Cartinge loading machine, P. Selby.	383,936 383,967 383,987 383,880 384,197 363,871 383,886 384,064 384,064 384,064 384,064 384,064 384,064 384,197 384,164 383,881 384,124 383,981 384,225 384,124 384,124 384,124 384,124 384,125 384,125 384,125 384,126 383,966 384,126 383,966 384,126 383,966 384,225 384,225 384,225 384,225 384,225 384,226 384,26
Brick klin, W. & S. H. Alsip. Brick or tile for building purposes, W. J. Pringle. Bridge, W. Harman. Bridge, metallic, M. L. E. Duval. Burger. See Hydrocarbon burner. Burners for incandescent lighting and making the same, stock for skeleton, E. Moreau. Bustle, H. P. Olmstead. Button, W. F. Niles. Button fastener, Clark & Ingraham. Button fastener, Clark & Ingraham. Button fastener, Clark & Ingraham. Button manufacturing machine, G. Heidmann et al. Buttons, making, S. Cottle. Buttons, etc., making, S. Cottle. Cable and car propeller, elevated, H. Casebolt. Can filing machine, G. H. Perkins. Car brake, G. B. Quigg. Car coupling, J. Coup. Car coupling, J. Coup. Car coupling, J. Coup. Car coupling, W. R. Chadsey. Car coupling, W. R. Chadsey. Car coupling, W. O. Rutledge. Car baeter, F. C. McElroy. Car ander, H. M. Barnhart. Car wheel, H. B. Allen. Car wheel, H. R. Allen. Car wheel, H. R. Allen. Car wheel, H. R. Allen. Car wheel, H. S. Hale. Car wheel, H. S. Hale. Car wheel, H. S. Hale. Car wheel, H. S. Hale. Car wheel, M. G. Biroy. Car care for anilway, M. A. Zurcher. Car heater, F. C. Berrow. Car dhanger, H. S. Hale. Car wheel, W. G. Birohart. Car wheel, M. G. Birohart. Car wheel, M. G. Birohard. Carwheel, M. G. Birow. Carriage bow, J. B. Fox. Carriage top, M. D. Taylor. Carriage loading machine, G. M. Petters. Cartridge loading machine, G. M. Petters. Cartridge loading machine, S. Maler.	383,936 383,967 383,850 384,197 363,871 383,886 383,905 384,064 384,019 384,064 384,019 384,064 384,019 384,019 384,019 384,019 384,019 384,019 384,121 384,121 383,901 384,123 383,911 384,124 383,911 384,121 384,121 384,123 384,123 384,124 384,124 384,124 384,124 384,125 384,125 384,25

(11) C. T. C. asks: 1. How can certain unsightly objects in a photograph be removed, for instance, a' lock of hair, a mole, etc.? A. Only by retouching the negative, or\_using powder, etc., on the brittle alloy.

(22) G.A.V. asks whether three small screw wheels running side by side and geared together C from center shaft would be better than stern paddle C wheel for light draught flat bottom river boat drawing one foot of water. A. No. It is well established by trial that the stern or side wheel only will do well with shallow draught vessels.

C

C

(23) C. H. F. asks the English and also the American standard of pipe tops, the pitch of thread C taper, and size of point of tap? A. 36 inch pipe 27 C threads to 1 inch, ½ inch and ½ inch pipe 18 threads C to 1 inch, ½ inch and ¾ inch pipe 14 threads to 1 inch, 1 inch. 11/4 inch. 11/6 inch and 2 inch 111/6 threads to 1 inch. 216 inch up 8 threads to 1 inch. All threads taper : **c**i % inch to 1 foot on each side. End of taps should be one-sixteenth inch smaller than diameter of bottom of Co thread at end of pipe, using pipe thread as a gauge. (24) C. H. L. asks: Can you tell me whether quicksilver standing a long time in a brass tube will injure the metal? What effect, if any, does it C have upon brass? A. It will quickly amalgamate the C brass, destroying its strength and forming a soft and

ase. See Show case.	
ash and package carrier, S. W. Barr	\$83,937
ash and parcel carrying apparatus, S. W. Barr	384,118
ash register and indicator, Heady & Patterson	384,158
astrating instrument, J. Phillips	384,215
ement, composition for making, J. Wolff	888,932
heck protector, W. I. Best	383,854
heckrein loop, E. R. Cahoone	384,017
hloroform from acetone, manufacture of, G.	
Rumpf	383,992
hurn, W. H. Crawford	383,866
lamp. See Jar clamp.	
law bar, A. R. Wygle	384,223
lip. See Whiffletree clip.	
lock striking mechanism, C. E. Burnham	384,191
lothes drier, E. S. Sutton	384,179
lothes rack, J. Danner	384,194
oat, W. H. Osmer	384,214
oat and hat hook, F. Taylor	384,001
offin fastener. W. H. Torbeck	384.181
ollar fastening, horse, Davis & Keith	\$64,227
ollar for cattle, bell, J. R. & E. R. Hill	384,057
ommode, Tolman & Roberts	384,006
ommode, toilet jar. Swafford & Burns	884,218
orrugating machine, S. Fox	384,031
orset. C. A. Griswold (r)	10.985
ot. folding, J. C. Porter	383, 985
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