

According to a recent writer in the London *Times*, the "French dyers have attained such extraordinary skill, that they can color up inferior qualities of silk so as to make them look far better than they are. In some cases they are able to charge the silk with lead and iron, which adds as much as one hundred or one hundred and fifty per cent. to the weight of it! All such artificial additions disappear when the tissue is exposed to any wear, however slight, and sometimes even when it is only exposed to the atmosphere. Let us admire and beware. Never have tissues looked so lovely as now; they charm the eye. But, also, never was beauty more deceitful; and, if our women cannot resist the temptation of lovely tints, let them at least take care to buy new silks from houses which are thoroughly to be trusted." If silk for dresses is open to this grave suspicion, how much more probable is the adulteration of sewing silk which is always sold by weight, although done up in skeins, or on bobbins and reels.

#### DECISIONS OF THE COURTS.

##### United States Circuit Court—Western District of Pennsylvania.

PAPER ROOFING.—JAMES HOWARD vs. ROBERT CHRISTY.

[No. 8, May Term, 1876.—At Law.—Decided November 13, 1876.—Before McKennan, C. J.]

The plaintiff was the first and original inventor of the inventions described and claimed in his patents No. 91,133, June 8, 1869, for method of preparing paper for roofing purposes, and No. 95,689, October 12, 1869, for a machine for carrying out such method. The original application was filed March 1, 1850, rejected April 9, 1850, withdrawn May 4, 1850, and afterward repeatedly renewed with the allowance of the patent No. 91,133. The plaintiff did not intend to and did not in fact abandon his said invention to the public. Nor was it in public use or on sale with his consent and allowance for two years before his original application.

MCKENNAN, C. J.:  
This is an action at law for the infringement of two patents granted to James Howard, the plaintiff, as follows:  
1. Patent No. 91,133, dated June 8, 1869, in which the invention claimed is "The method described (in the specification) for preparing paper for roofing purposes—to wit, by passing the paper through liquid asphaltum, heated to that degree which will cause the paper and the asphaltum on it to dry as fast as it is drawn from the reservoir of liquid asphaltum."  
2. Patent No. 95,689, dated October 12, 1869, in which the invention claimed is

"The arrangement of the reservoir A, windlasses B and C, adjustable rollers D, scrapers E and H, and rollers G and J, constructed, arranged, and operating substantially as described in the specification and for the purposes therein set forth."

The parties have stipulated to waive a jury, and that the issues of fact in the case be tried and determined by the court, and the evidence on both sides has been taken in writing and submitted to the court.

Upon the evidence thus submitted the following facts are found:

1. The inventions described and claimed in said patents are novel and useful.

2. The plaintiff was the first and original inventor thereof, and the date of his invention is referable to the date of his original application for a patent—to wit, the sixth of December, 1849.

3. This application was filed in the Patent Office March 1, 1850, accompanied by a specification and by a model on March 5, 1850, was rejected April 9, 1850, and was withdrawn May 4, 1850.

4. It was afterward repeatedly renewed, (when does not appear,) and resulted in the allowance of the patent aforesaid.

5. During the interval between the date of his application and the allowance of the patent, the plaintiff did not intend to, and did not in point of fact, abandon his said invention to the public.

6. The said inventions were not in public use or on sale with his consent and allowance of the plaintiff for a period of two years before his original application for a patent.

7. The defendant has practised the method described and claimed in Letters Patent No. 91,133 on a machine of similar construction to that described in Letters Patent No. 95,689, and is, therefore, an infringer.

These findings embraced all the material issues of fact raised by the pleadings.

Several questions of law have been suggested touching the alleged defectiveness of the specifications, and the presumptive abandonment of the invention from delay in the procurement of patents, but as the objections to the plaintiff's title on these grounds have no warrant in the well-settled principles of the law of patents it is only necessary to say that they are unsustainable.

Upon the whole case the court is of the opinion that the plaintiff is entitled to recover, and, as the damages have been assessed by stipulation at \$300, judgment with interest, to be entered upon the findings in favor of the plaintiff for that sum.

James J. Johnston and George H. Christy, for plaintiff.  
Joseph M. Gazzam, for defendant.]

#### NEW BOOKS AND PUBLICATIONS.

**BRYANT'S BOOK-KEEPING:** a Treatise on the Science of Accounts, Elementary and Practical, containing a Thorough Explanation of the Principles and Practice of Double Entry Book-Keeping, adapted to the Use of Universities, Business Colleges, etc. Price \$3. Buffalo, N. Y.: Published by the Author.

Mr. Bryant's long experience as a teacher of the science of commercial accounts has enabled him to compile a work of the highest value for simplicity and practical value. The book is a thorough and complete treatise, written with clearness and illustrated with numerous specimen pages of account books. We recommend it to all young men desirous of acquiring a knowledge of the useful and indeed indispensable art of book-keeping.

**RURAL HYDRAULICS, A PRACTICAL TREATISE ON RURAL HOUSEHOLD WATER SUPPLY:** giving a full Description of Springs and Wells, Pumps, Hydraulics, etc. By W. W. Grier. Price 75 cents, free by mail. Philadelphia, Pa.: Henry Carey Baird & Co., 810 Walnut street.

A practical little work on an important subject, free from technical and abstruse phraseology.

**NOTES ON LIFE INSURANCE. WITH APPENDIX.** By Gustavus W. Smith, late Insurance Commissioner of Kentucky. Price \$2.00. New York city: D. Van Nostrand, 23 Murray street.

The subject of this volume is an inexplicable mystery to many, and we think that the book will meet a great necessity. The author is evidently a gentleman of great skill and knowledge; and the wise principles he lays down so clearly will enable persons of limited education to acquire sufficient knowledge to judge for themselves as to the trustworthiness of the multitude of insurance companies which are now claiming the confidence of the public.

**ELEMENTARY ARCHITECTURAL DRAWING.** Edited by Charles Babcock, Professor of Architecture in the Cornell University, Ithaca, N. Y. Nos. 1 to 8. New York city: D. Appleton & Co., 549 and 551 Broadway.

Messrs. Appleton are now publishing Krusi's courses of examples in free hand and mechanical drawing. Six series are announced, each edited by a professor of well known ability and reputation. The eight parts of the architectural series, now before us, comprise an extended course of examples of great variety and excellence, calculated to form the taste as well as train the hand and eye of the student. The occasional use of free hand work in depicting the various building materials is singularly effective and correct.

**THE QUARTERLY JOURNAL OF INEBRIETY.** Published under the auspices of the American Association for the Cure of Inebriates. T. D. Crochers, M. D., Secretary, Birmingham, N. Y. Subscription \$3.00 per year.

The name of this new comer in the field of periodicals is rather puzzling. By a parity of reasoning, a paper printed by a prison association might be called a journal of petty larceny—or bigamy—which would startle people. This aside, the new magazine is an excellent and useful publication, and we have no doubt, will do great good in disseminating correct and scientific views regarding the sad disease of drunkenness and its best mode of cure. The first number contains Dr. Beard's excellent address on the Causes of Inebriety, which we have already reviewed in full. There are besides the proceedings of the Association above named, beside clinical notes and other interesting articles.

#### Inventions Patented in England by Americans.

From November 21 to December 21, 1876, inclusive.

AERATING CHURN.—T. Simmons, Hartford, Conn.  
AIR PUMP.—W. F. Garrison, Brooklyn, N. Y.  
ARTIFICIAL STONE.—L. L. Leathers, Oakland, Cal.  
BOX COVER, ETC.—W. L. Hubbell, New York city.  
CAR BRAKE, ETC.—L. O. Rost, East Minneapolis, Minn.  
CAR COUPLING.—H. G. Russell et al., Lincoln, Ill.  
CLEANSING CARPETS.—G. S. Norris (of Baltimore, Md.), London, England.  
CLEANSING FABRICS.—W. Maynard, New York city.  
EMBROIDERER.—A. Mason, New York city.  
EXPLOSIVE.—E. Judson, San Francisco, Cal.  
FLEXIBLE TUBING.—H. Wakeman, New York city.  
FRYING PAN.—J. E. Bardell et al., New York city.  
GRAINING WOOD.—J. R. Cross, Cleveland, Ohio.  
HARVESTER RAKE.—W. A. Wood, Albany, N. Y.  
INESTAND BASE, ETC.—Rosenfeld & Co., New York city.  
LAMP WICK, ETC.—H. C. Scott, Clinton, Iowa.  
LOADING HAY, ETC.—J. W. Foust et al., Meadville, Pa.  
LOCK AND KEY.—M. Runkel, New York city.  
MAKING ICE, ETC.—C. L. Riker, New York city.  
MAKING NUT BLANKS.—S. S. Townsend, Philadelphia, Pa.  
MAKING OZONE, ETC.—H. Milsom, Buffalo, N. Y.  
MAKING SCREWS.—American Screw Company, Providence, R. I.  
MAKING TUBES.—American Tube Works, Boston, Mass.  
NAIL FEEDING DEVICE.—W. H. Field, Launton, Mass.  
PIPE COUPLING.—L. Richardson, Brooklyn, N. Y.  
PRESERVING MEAT, ETC.—A. Montgomery, New York city.  
RAILROAD TIE.—D. S. Whittenhall, Chicago, Ill.  
REDUCING ORES.—T. S. Blair, Pittsburgh, Pa.  
REVERSING VALVE.—H. S. Maxim, New York city.  
SCOURING GRAIN, ETC.—W. P. Clifford, Elmore, Ill.  
SCOURING HIDES, ETC.—B. F. Larrabee, Lynn, Mass.  
SPRING MATTRESS.—Howe Spring Bed Company, New York city.  
SPRING MOTOR.—R. Rhett, Baltimore, Md.  
STOWING COTTON, ETC.—M. J. Walsh, New York city.  
STRAIGHTENING WIRE, ETC.—W. H. Paine, Brooklyn, N. Y.  
TUYERE, ETC.—A. J. Haws, Johnstown, Pa.  
UMBRELLA, ETC.—A. A. Valentine et al., New York city.  
UNLOADING GRAIN.—G. Milsom, Buffalo, N. Y.  
VALVE.—N. C. Locke et al., Salem, Mass.  
VALVE, ETC.—E. Purvis, New York city.  
VENTILATION, ETC.—J. S. Linsley, New York city.  
WATER GAUGE, ETC.—W. Andrews, Lisbon, Me.

#### Recent American and Foreign Patents.

##### NEW HOUSEHOLD INVENTIONS.

###### IMPROVED CENTER SLIDING GASALIER.

Samuel B. H. Vance, New York city, assignor to Mitchell, Vance & Co., of same place.—By suitable construction, as the center light is drawn down, a cord unwinds from a drum L, which turns the said drum, and coils up a spring. The tension of the spring and the weights of the square tube and its attachments so nearly balance each other that the center light will be sustained in any position into which it may be adjusted, but may be raised and lowered with ease.

###### IMPROVED DESK.

Ernest N. Döring, New York city.—When the lid of the table is thrown back pigeon holes attached thereto are exposed. To the lowest pigeon hole a desk leaf is hinged which when the lid is opened falls into an inclined position, ready for use.

###### IMPROVED LAMP.

David Dickson, Raglan, Ontario, Canada.—The object of this invention is to do away with that portion of the chimney which is most liable to fracture from unequal expansion, and substitute therefor a metallic top, which may also answer the purpose of a reflector. The top shuts a small distance over the top of the glass cylinder, and is retained in place by the spiral springs, fastened to tubes which support the wick tube.

###### IMPROVED GAS OVEN OR SUMMER RANGE.

Benjamin Shourds, Philadelphia, Pa.—This embodies improvements in that class of ovens or summer ranges commonly known as gas ovens, because the draught, coal gas, etc., from the fire can be caused to pass through the oven when the lids in the bottom plate thereof are removed. The side thirds of the top plate are inclined at an angle of about 45°, and its central third is flat, and is provided with an angular brick work. Upright openings and dampers formed in the upper parts of the side plates of a summer range, above the lower edges of the inclined side parts of the top plate; and a flue is formed upon the rear plate. Dampers are provided in connection with an opening formed in the upper part of the back plate.

##### NEW AGRICULTURAL INVENTIONS.

###### IMPROVED CULTIVATOR.

William B. Sturgis, Shelbyville, Ill.—The crank axles are secured in place adjustably in a bar, that is arched, so that the machine may be drawn over tall plants. There are also new devices to enable the plow to be readily guided, to prevent the standard being broken when striking an obstruction and also to support the plows away from the ground when turning around and passing from place to place.

###### IMPROVED GUIDE FOR BUILDING RICKS AND STACKS.

John Murdock and Henry Murdock, Poseyville, Ind.—This relates mainly to gates which travel on a vertical post being hoisted as the stack is built up to them by means of a winchlass. They are so constructed as to contract as the top of the stack is reached, and when the latter is nearly complete they may be altogether removed.

##### NEW MISCELLANEOUS INVENTIONS.

###### IMPROVED PROCESS OF PREPARING METAL SURFACES FOR PRINTING UPON.

Joseph T. Comross, New York city.—The object of this invention is to form such a surface upon metal plates that it may be printed upon direct, without any transfer process, and which will enable the plates, after being printed upon, to be struck up with dies, and otherwise manipulated without cracking, chipping, or otherwise injuring said surface. A mixture of pale boiled oil, Benguela varnish, turpentine, and white lead ground in oil is first applied hot. The plates are then placed in an oven heated to 125° Fahr., after which they are powdered with a mixture of magnesia and soap stone, and are then ready to be printed upon. We have seen some of the most beautiful samples of metal card printing in colors, by this process that have ever been executed. The work closely resembles chromo picture printing in the perfection in which the colors are laid.

###### IMPROVED QUILTING FRAME.

Ira M. Hope, Morocco, Ind.—The quilt is fastened to muslin strips attached to rollers, at two sides, and secured to bars at the other sides by cords. As the quilt is wound on the rollers, the cords stretching it to bars are disconnected. When thus wound sufficiently the bars are altogether detached, and the rollers are put into benches and held by ratchet wheels and pawls to stretch the quilt between them, while the hooks stretch it in the other direction.

###### IMPROVED WATCH PROTECTOR.

Henry A. Rosenthal, Brooklyn, N. Y.—This is an improved device for connecting a watchchain and watch with each other, so constructed that it may be set to prevent the watch from being withdrawn from the watch pocket by a thief. In a short tube, the upper end of which is closed, and the lower end of which is flared, is fitted a block, which slides up and down within it. The movement of the block is limited by a screw, inserted in it,

and which passes through a longitudinal slot, formed in the side of the tube. The slot at its upper end is extended at right angles with the length of the tube, so that by turning the tube so as to bring the screw into the lateral arm of the slot the block will be locked in the upper end of the said tube. When the tube has been pushed down to the cap and turned so as to bring the screw into the lateral arm of the slot the watch may be drawn from the pocket as readily as if the device were not there; but to guard against having the watch drawn from the pocket by a thief, the tube is turned to bring the screw into the upper end of the longitudinal arm of the slot; then, if the watchchain is drawn upon, the tube is drawn upward upon the block, and springs force four or more or less hooks outward, which catch upon the sides of the pocket and prevent the watch from being withdrawn from said pocket.

##### NEW MECHANICAL AND ENGINEERING INVENTIONS.

###### IMPROVED WATER WHEEL.

Lewis A. Struble, Salt River, Mich.—This waterwheel is provided with hinged buckets supported radially to the axis of the hub by projections that extend beyond their pivots and rest on the revolving hub. The buckets are claimed to work always in a position radial to the hub, and thus to secure the greatest effect from the water.

###### IMPROVED MIDDINGS SEPARATOR.

John J. Haller, Ripley, N. Y., assignor to himself and John W. Baker, of same place.—In connection with the beating and screening cylinder a fan blower is arranged with air inlets at its head and a narrow longitudinal slit at the side for spreading the blast in a thin sheet. Adjustable deflectors and a divider are provided, the latter serving to keep the flour that falls from the screen separate from the lighter particles that fall to the front of the case.

###### IMPROVED COMPENSATING PENDULUM.

Eben M. Corwin, Barry, Ill.—In this invention the variations of the length of the pendulum wire, due to different temperatures, are compensated by placing between the ball and its supporting and regulating nut a piece of hard rubber, which, being secured to the ball by a screw at one end, and resting upon the regulating nut at the other, keeps the center of gravity of the ball at a uniform distance from the point of suspension.

###### IMPROVED GAS METER.

Julian I. Alexander, Baltimore, Md., administrator of John H. Alexander, deceased.—This is an improved device that is claimed to measure the gas accurately as it passes from the service pipe to the pipe leading to the burners. It consists in an improved gas meter formed by the combination of a box, a tubular arm wheel, a spindle, and a register. In the rear side of the outer end of each of the arms of the wheel is formed a small hole, through which the gas escapes, and, by its reaction against the gas in the box, revolves the wheel, the number of revolutions of said wheel being recorded by the register, so that by calculating the quantity of gas that escapes at each revolution, and recording the number of revolutions of said wheel, the quantity of gas that passes through the machine can be accurately known. It is very simple in construction.

###### IMPROVED METAL CAR FRAME.

Frederick J. Kimball, Philadelphia, Pa.—This is a novel and simple construction of a car frame of channel bars, angle bars, iron and wood corner pieces, and wood beams, whereby great strength is secured without excessive weight, and with economy in the cost. The side and end pieces of the bed frame are of channel iron, with the channel arranged outside and filled with wood, except at the corners, where metal knee filling pieces are used to make struts by riveting or bolting the bars to them. The back of one of the bars is also extended along the back of the other, and secured to it. Through these metal corner pieces longitudinal and transverse tension rods or bolts are arranged, for straining the frame up tight. The wood filling serves for nailing the siding to, as well as for stiffening the channel bars. Other channel bars are slightly curved outward, extending through the middle portion of the bed frame from end to end, and are attached thereto by flanges and riveted to the end pieces, and supported at suitable intervals. The latter bars are curved in a horizontal plane, because the shock which occurs when the cars come together comes mainly upon the middle stringers, and when the strain is too great for the rods that pass through the thimbles the said bars will readily spread, and can be afterward easily drawn back into place. If not curved, they might bend upward or downward, so that they could not be straightened without removal from the car frame.

###### IMPROVED AUTOMATIC BRAKE.

Hugh McCallip, Hope, Bartholomew county, assignor to himself and Norton R. Champion, Shelbyville, Ind.—This invention is so constructed as to be applied by the momentum of the cars as they run together when the traction power is checked, and to be withdrawn as the traction power is again applied. By pressing on the bumper the brakes will be applied on one set of wheels as long as the bumper meets with resistance on the forward motion. During this time the opposite brake wheels are held firmly in the straps, but motionless, while the axle revolves in them, the pawls being off. When it is desired to change the direction of the car, the inner end of a push bar is changed from one lever to the other. When the pulling power of the engine is checked, the brakes are automatically applied to one set of wheels and the train is stopped. The reversal of the engine now will produce no effect upon the position of the brakes; but the change in the direction of the rotation of the axle releases the pawls from one set of wheels and causes them to take hold on the opposite ones, when the train may be backed without further obstruction, the brakes remaining open as long as the pushing continues. When the pushing power of the engine is checked, the momentum carries the train away from it and the slack motion of bumper applies the brakes to the opposite wheels, thus braking backward as well as forward.

###### IMPROVED RADIAL DRILLING MACHINE.

Alfred Box, Philadelphia, Penn.—This is a contrivance of the devices comprising a radial drill, whereby the power is transmitted to the drill in whatever position it may occupy by a belt in the place of the bevel gears and shafting heretofore employed.

###### IMPROVED BALING PRESS.

William B. Duncan, Huntington, Tenn., assignor to himself and A. F. Estes, of same place.—This is a new press for baling cotton, hay, and other articles requiring to be compressed into bales. The improvements are mainly in the construction of a novel pawl and ratchet mechanism in connection with the follower.

###### IMPROVED COUPON NIPPER AND TICKET PUNCH.

Frank Walker, Santa Barbara, Cal.—The operation of this device is as follows: A coupon is placed in an aperture when a motion of the handle detaches it. It is then forced against fingers, causing a tumbler to turn until the coupon slips from between the fingers into a receptacle. The tumbler being liberated, a spring returns it to its normal position, at the same time causing a hammer to strike the bell.

###### IMPROVED OILER FOR CAMS.

John Henry Beal, Canton, Mass.—This consists in the combination of a piece of oil-saturated felt, and its spring holder, with a cam. The elasticity of the spring holds the saturated felt always pressed against the cam, and thus keeps the said cam constantly oiled.

###### IMPROVED COMBINED ANVIL AND VISE.

William E. Caneby, Rochester, Minn.—This is a combined anvil and vise for the use of harness makers, tanners, farmers, and others. The vise is secured to the anvil between projecting side guides by a fastening screw, and bears, by a lateral shoulder, on the top of the anvil.

Artificial Butter.

To the Editor of the Scientific American: Owing to the receipt of much correspondence concerning my article on artificial butter, which appeared in the SCIENTIFIC AMERICAN SUPPLEMENT, N. Y., Nos. 48 and 49, I wish to state that I own no patent on the process. The only patent held is Mage's, which is owned by the United States Dairy Company, 6 New Churchstreet. All letters, therefore, should be forwarded to that address. The process I described in my article is simply an elaboration of that patented by Mege, and cannot be used without infringing on the United States Dairy Company's patent. HENRY A. MOTT, JR., E. M., PH. D. New York City.

Business and Personal.

The Charge for Insertion under this head is One Dollar a line for each insertion. If the Notice exceeds four lines, One Dollar and a Half per line will be charged.

Cotton Seed Huller. The judges of the Centennial Commission awarded to D. Kahnweiler, 120 Centre St., N. Y., medal and diploma, for his huller, for the following reasons: For being well made, and thoroughly efficient, supplying an increasing want on cotton plantations: a means for preparing the seed into a highly valuable food.

Agricultural Implements and Industrial Machinery for export and domestic use. R. H. Allen & Co., N. Y.

Skinner Portable Engine Improved, 2-12 to 10 H. P. Skinner & Wood, Erie, Pa.

Engines, Geo. F. Shedd, Waltham, Mass.

Wire Needle Pointer, W. Crabb, Newark, N. J.

Send for circular of Brass Hydraulic Engine for blowing organs. Hilbourne L. Roosevelt, Church Organs, New York.

Patented Articles and Novelties introduced to the trade by G. Webster Peck, Manufacturers' Agent, 110 Chambers St., N. Y. Correspondence solicited.

Hand Fire Engines, Lift and Force Pumps for fire and all other purposes. Address Rumsey & Co., Seneca Falls, N. Y., U. S. A.

Power & Foot Presses, Ferracuta Co., Bridgeton, N. J.

Magic Lanterns and Stereopticons for Parlor Entertainments and Public Exhibitions. Pays well on small capital. 74 page catalogue free. Centennial Medal and Diploma awarded. McAllister, 49 Nassau St., N. Y.

Superior Lace Leather, all sizes, cheap. Hooks and Couplings for flat and round Belts. Send for catalogue. C. W. Army, 148 North 3d St., Philadelphia, Pa.

F. C. Beach & Co., makers of the Tom Thumb Telegraph and other electrical machines, have removed to 530 Water St., N. Y.

For Best Presses, Dies, and Fruit Can Tools, Bliss & Williams, cor. of Plymouth and Jay Sts., Brooklyn, N. Y.

Water, Gas, and Steam Pipe, Wrought Iron. Send for prices. Bailey, Farrell & Co., Pittsburgh, Pa.

Diamond Tools—J. Dickinson, 64 Nassau St., N. Y.

Hydraulic Presses and Jacks, new and second hand. Lathes and Machinery for Polishing and Buffing metals. E. Lyon, 470 Grand St., N. Y.

Solid Emery Vulcanite Wheels—The Solid Original Emery Wheel—other kinds imitations and inferior. Caution.—Our name is stamped in full on all our best Standard Belting, Packing, and Hose. Buy that only. The best is the cheapest. New York Belting and Packing Company, 37 and 38 Park Row, New York.

Steel Castings from one lb. to five thousand lbs. Invaluable for strength and durability. Circulars free. Pittsburgh Steel Casting Co., Pittsburgh, Pa.

M. Shaw, Manufacturer of Insulated Wire for galvanic and telegraph purposes, &c., 259 W. 27th St., N. Y.

Shingle, Heading, and Stave Machine. See advertisement of Trevor & Co., Lockport, N. Y.

For Solid Wrought Iron Beams, etc., see advertisement. Address Union Iron Mills, Pittsburgh, Pa., for lithograph, etc.

See Boulton's Paneling, Moulding, and Dovetailing Machine at Centennial, B. 855. Send for pamphlet and sample of work. B. C. Mach'y Co., Battle Creek, Mich.

Wanted—Novel and practical invention, by a reliable house, for manufacturing. Address Post Office, Box 25, Chillicothe, Ohio.

Chester Steel Castings Co. make castings twice as strong as malleable iron castings, at about the same price. See their advertisement on page 62.

Articles in Light Metal Work, Fine Castings in Brass, Malleable Iron, &c., Japanning, Tinning, Galvanizing. Welles Specialty Works, Chicago, Ill.

Wanted—A man that thoroughly understands the Galvanizing of sheet iron, etc. None but first class men need apply. Address with references, P. O. Box 903, Montreal, Canada.

Boosey's Cheap Music and Music Books. Full Catalogues free by mail. Boosey & Co., 32 East 14th St., New York.

For Sale—Two sets Hydraulic Presses, 10 inch cylinder, 2 foot lift, 100 tons pressure, 5 inch one set, 4 inch other. In good order. P. O. Box 3396, Boston, Mass.



C. A. B. will find directions for bleaching beeswax chemically on p. 299, vol. 31.—M. F. will find a description of the glacier theory on p. 90, vol. 31.—A. K. will find directions for lining casks with a waterproof tasteless compound on p. 11, vol. 34.—C. J. W. will find a description of the Solvay soda process on p. 404, vol. 34.—A. F. C. and others are informed that Mr. Seth Green's address is Rochester, N. Y.—A. L. M. will find on p. 360, vol. 34, directions for renovating clothing.—R. C. will find an explanation of the effect of the moon on the tides on p. 64, vol. 28.—A. J. B., J. K., B. L., H. K., C. F. S., N. J. W., H. A. T., B. M. S., and others who ask us to recommend books on industrial and scientific subjects, should address the booksellers who advertise in our columns, all of whom are trustworthy firms, for catalogues.

(1) R. D. L. T., of Uddevalla, Sweden, asks: Please explain the principle of Bourdon's manometer. Why does the tube straighten when the pressure rises? A. When pressure is applied to the interior of a tube having an elliptical or flat section, the tube tends to

become circular. In thus changing its form, the outer portion is drawn away from the original center of the curve of the tube, and the inner portion is drawn nearer to the original center. The effect of this is to move the center of the curve, or to straighten the tube.

(2) B. R. T. says: We have a new feather bed that smells badly. Is there any remedy except renovating by steam? A. Steam renovation is the best and surest method. The feathers have been placed in the bedding while yet green. The objectionable odor may be got rid of by removing the feathers from the bed, sprinkling them with a little dilute solution of salicylic acid, and allowing them to dry in a warm room, or in strong sunlight in dry air.

(3) J. H. S. asks: What kind of ink or other substance could be used on tin (and not rub or wash off) with a rubber stamp? And what substance could be used in the same manner on porcelain or opal glass shades? A. Try a well triturated paste of dark-colored gum animé, ivory black, and turpentine. This should be prepared at a gentle temperature over a water bath.

I have tried, as you recommended, leather hose on a small force pump for pumping petroleum and its products through, and I find that the fluid penetrates the hose so freely as to render it useless. What could I use to close the pores of the leather? A. We do not know of anything that will answer these requirements. Can you not use a small leaden conduit? This would be impervious to the oil, and flexible to some extent.

(4) R. W. T. says: Please give me a recipe for waterproofing cotton rope, so that the rope can be used constantly under water, and yet impart no unpleasant taste or smell to the water? A. Saturate the materials of the rope with a strong solution of alum, dry-pass through a bath of dilute alkali (aqueous solution), and wash repeatedly in hot water.

How can I fasten galvanized iron balls or cylinders, with holes through the centers, on galvanized wire rope? A. If we understand you, a small screw provided with a set nut will answer; or you can make small knobs with wire, above and below the cylinder, on the wire rope.

(5) C. W. McM. says: The author of an engineer's pocket book, after giving the theoretical, gives the practical, amount of atmospheric air necessary for the combustion of 1 lb. bituminous coal as 891.18 cubic feet; and he then states, as the necessary area for the escape of this volume at the bridge wall, that it will be adequate to make that area 2 square inches for every 13 lbs. of coal consumed, per hour, and so on in proportion. Am I correct in thus figuring: Given grate bar surface 4 feet long x 4 feet wide = 16 feet? Consuming 208 lbs. coal per hour, this gives 13 lbs. per foot square per hour. Multiplied by 2 square inches, the necessary area given, this shows 32 square inches. Is this correct? A. By the rule as given, the requisite area is 2 x 13 = 26 square inches; but the apparent meaning of the rule is to multiply the pounds of coal burned per hour by 2, to get the area in square inches. Of course we do not know positively what the author intended; but this is our understanding of his meaning. If you make the area between 2 1/2 and 3 square feet, and the other parts are properly proportioned, we think you will secure satisfactory results.

(6) A. Y. McD. says: I have an upright tubular boiler; the grate is 2 feet below the flue sheet. Would it make steam more quickly if I raise the grate 8 or 10 inches? I cannot see how any heat can be lost, and yet I am told by a practical boiler maker that the nearer the fire is to the flue sheet the more economical is the boiler in fuel. A. If there is sufficient air space below you will not be likely to gain anything by the change.

(7) R. W. says: A 28 inch water wheel is put in under a 13 feet head; it makes 464 revolutions per minute, and drives one run of wheat stones and the necessary machinery, grinding 8 bushels per hour with 1/2 gate. An 18 inch wheel, under the same head, is constructed similarly in every particular, but it only makes 365 revolutions. I cannot find a satisfactory solution of the difficulty. Is there a way of calculating the speed derivable from any wheel? A. From the data sent we are not able to throw much light on your questions. If the first wheel is underloaded, and the second has an excess of work, the difference in revolutions is easily accounted for. It is quite possible, too, that the difference is due to design, and is intentional. It is not generally true that, of two wheels, the one that runs the fastest is the best. The best wheel is the one that gives the greatest effect from the water passing through it. For a given case, it can be shown that each wheel has a speed at which it will give the best effect; and manufacturers of successful wheels make use of this fact in perfecting their designs.

(8) A. C. asks: Is the shrinkage equal from middle to each end, in making a long iron casting on end? A. No; it is most at the top of the casting.

(9) C. T. McC. asks: What would be the power of a double engine connected at a right angle, 3 feet by 3 feet, cut-off half stroke, running at 130 revolutions, with 120 lbs. pressure? A. About 3,000 horse power. 2. What power would be exerted at the rim of a pulley 10 feet in diameter. A. Force at periphery of pulley about 25,000 lbs. 3. What size should a multi-tubular boiler be for such an engine? A. Boiler should have from 12 to 15 square feet of heating surface for each horse power of engine.

(10) T. H. Y. asks: Can you give me a recipe for checking, permanently, fermentation in wine and cider, that will not leave any flavor, as sulphite of lime does? A. Bottle the liquor, and immerse a number of the bottles, with the mouths only projecting, in a large vessel of water. Loosen the stoppers and heat the water until of a uniform temperature of 180° Fah.; then remove the bottles, stopper and seal them tightly, and place in an inverted position.

(11) T. O. M. asks: For a stern wheel boat, high pressure, what size boiler and engine do you recommend? The boat is 60 feet long, 18 feet wide, and 3 1/2 feet deep. A. If you use a single engine, attached directly to the wheel, you may make it from 10 to 12 inches in diameter, and of 30 inches stroke. Use a locomotive boiler 40 inches diameter, 12 feet long, with from

400 to 450 square feet of heating surface in fire-box and tubes.

(12) J. F. E. asks: Can you give me a good recipe for making spirit copal varnish? A. Fuse 12 lbs. of colorless gum copal mixed with clean sand in a strong iron vessel capable of being closed airtight, and provided with a suitable stirring apparatus; close the vessel, and while the resin is still in the fused condition pump into the vessel a mixture consisting of 1 1/2 gallons of strongest alcohol, 1 gallon oil of turpentine, and 1 quart of ether; heat for some time with constant stirring. The varnish is clarified by decantation, or, for the finest quality, by filtration through a tall column of granular animal charcoal (bone black).

(13) F. N. B. says: You say, as to winding magnets for telegraph sounders, "wind the magnet with No. 30 silk covered wire." How many feet or what weight of wire shall I use on a magnet for from 1 to 12 miles line? A. About 900 feet or a little over 1 1/2 lb. of No. 28 wire in each helix will answer very well for a line 12 miles long. 2. What kind of iron shall I use for the magnet and armature? The blacksmiths say that iron called nailrod is the softest. Would that work? A. Any kind of soft iron will answer. 3. What difference should be made in winding a magnet for a wire a few feet in length and one 12 miles long? A. About 250 feet of No. 22 copper wire in each helix will make a good set of coils for a magnet to be used in a short circuit.

(14) J. C. asks: How is tetrachloride of carbon made, and what is it used for? A. It is made from chloroform, by acting upon it with a current of dry chlorine gas, or by saturating chlorine with vapor of carbon disulphide, and passing through a red hot tube filled with fragments of porcelain. The products are carbon tetrachloride and sulphur dichloride. The last named is removed by treatment with alkalis. The method first given is to be recommended. Tetrachloride of carbon is said to be obtained as a by product in several technical operations. We do not know to what important technical uses it is applied.

(15) C. K., J. B. M., and others: There is nothing that can be added to silver or nickel electro-plating baths to so influence the deposition of the metal as to obviate the necessity of subsequent burnishing. The whole success of the electro-plater's art lies, first, in producing a smooth and, if necessary, polished surface to the particle to be plated; second, in so freeing the prepared surface from all traces of oil, grease, or metallic oxides that the metal may have absolute contact with the electrolytic deposit; third, that the bath be in proper condition and free from all dissolved, mechanical, and surface impurities; fourth, that the surface of the anode be proportioned to the surface of the cathode or object to be plated. The anode must be of the same metal as that of which the bath is a solution; and the batteries must be constant, and neither too strong nor too weak. The work should be connected with the battery at the moment of or before immersion in the electrolyte. If the current is too strong, the work will be "burned" (the deposit blackened); if too weak, it may be crystalline and liable to scale off. If the conditions are properly fulfilled, the work on coming from the bath, and after having been dried with a little sawdust and a cloth, will present a clear, smooth, metallic appearance, the luster of which is heightened by burnishing.

(16) T. N. H. says: On November 22, at San Francisco, the barometer marked 30.15 inches, at Portland 30.28, and at Salt Lake 30.24. I believe that there is a corresponding decrease in the height of the column of mercury from sea level to different altitudes, and Salt Lake is upward of 4,000 feet above the ocean. I do not understand this report of the barometer. Two years ago I obtained a glass tube of 30 or more inches in length, and from the open end carefully filled it with pure quicksilver, and having previously filled a small bottle with quicksilver, I put my finger firmly over the end of the tube, inverted it, and carefully inserted it in the bottle. There is a vacuum of some 5 inches, and the average reading of the height of the column of quicksilver are 26.5 inches. But the variations do not correspond with my ideas. For instance, it will storm when the mercury marks 26.75, and there will also be fine weather. Again, when the mercury marks 25.75, there will be fine weather and also storm. Again there will be no change or fall in the mercury until some little time has elapsed after the commencement of a storm. The altitude of this place is about 2,500 feet above the sea. Have I properly constructed my barometer? A. We think, from your account, that your barometer is somewhat defective in its action on account of the imperfect removal of air in filling it. We could not do justice to the subject in these crowded columns; but there are several works published by the Smithsonian Institution that will give you considerable information, and in the reports of the weather bureau you will find many facts relating to changes as affected by weather.

(17) A. C. R. says: I have a lump of green vitriol (sulphate of iron). When I placed it on the shelf it was clean but now it is covered with white spots. Please tell me the cause, and also what the white substance is? A. When protosulphate of iron is exposed for any length of time to a dry atmosphere, it gradually loses its water of crystallization, and is converted superficially into a dry white (or greenish white) powder. This may be avoided in great part by covering the crystals with a suitable glass shade.

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

C. H. A.—It is pyrolusite. If free from iron and clay, it is worth from \$10 to \$20 per ton in New York city.—G. A.—It is apparently a portion of the vertebrae of some large animal. It is much broken, and we cannot classify it. The resinous-looking body is bitumen.—S. B. W.—It is sulphide of iron. See p. 7, vol. 36.—M. G. P.—The berry has been examined by several dealers in spices as well as by professional experts; but none of them are able to identify it. Send us a larger sample.—A. G.—No. 1 is trap rock, and contains nothing valuable. No. 2 is limonite, or hydrated peroxide of iron. No. 3 is partially decomposed sulphide of iron. See p. 7, vol. 36.

COMMUNICATIONS RECEIVED.

The Editor of the SCIENTIFIC AMERICAN acknowledges, with much pleasure, the receipt of original papers and

contributions upon the following subjects:

- On Railroad Accidents. By J. M. L.
On the Hell-Bender, etc. By W. S. A.
On Porcelain. By S. W.
On Boats at the Centennial. By J. G. S.
Also inquiries and answers from the following:
H. H.—J. P.—J. N. H.—R. K. B.—J. F. P.—C. S. W.
—C. N.—G. G.—R. D. C.—A. B. W.—S. H. L.

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 pleasure in answering briefly by mail, if the writer's address is given.

Hundreds of inquiries analogous to the following are sent: "Who sells sail canvas suitable for ice boats? Who makes hardened glass tubes for water gauges? Who sells lactometers? Whose is the best electric engine? Who sells bisulphide of carbon?" 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 obtained.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH Letters Patent of the United States were Granted in the week Ending

December 19, 1876.

AND EACH BEARING THAT DATE. [Those marked (r) are reissued patents.]

A complete copy of any patent in the annexed list including both the specifications and drawings, will be furnished from this office for one dollar. In ordering, please state the number and date of the patent desired, and remit to Munn & Co., 37 Park Row, New York city.

Table listing various inventions and their patent numbers, including items like Abdominal supporter, Aerial machine, Alarm for boilers, Amalgamating apparatus, Ash sifters, Atomizer, Bake pan, Bale tie, Barbed metal plates, Bed chair, Bee hive, Bell, Bevel, Blanket, Blasts, Board roofing, Bob sled, Boiler covering, Book case, Book clip, Book support, Bottle stopper, Bottling aerated liquids, Brick treating, Bung for barrels, Button backs, Can head, Can opener, Candy, Car brake, Car platform, Car starter, Car stove, Cartridge shell, Case for stop cocks, Casting glass plate, Check row corn planter, Cheese press, Child's carriage, Chromatope toy, Cigar mold plungers, Cloth finishing machine, Clothes dryer, Clutch for hoist, Coal hod, Coal scuttle and sifter, Coal sifter, Coating of barrels, Coffee pot, Coffey dam, Collars, Concrete pavement, Converting motion, Corn planter, Corn planter, Cotton gin, Crosscut saw handle, Cultivator, Curtain fixture, Curtain fixture, Cuspador, Desk and cabinet, Die, paper collar, Dishing metals, District telegraph box, Door check, Door lock, Dredging machine, Drying apparatus, Drying apparatus, Ear muffer, Electro harmonic telegraph, Envelope, Envelope machine, Fan blower, Fare register, Fence, Fence post, Fence post, Filter rack, Fire hose, Fire kindler, Flavoring tobacco, Flower frame, Folding table.