

SCIENTIFIC AND PRACTICAL INFORMATION.

UTILIZATION OF FATTY MATTER FROM THE WASHING WATERS OF CLOTH FACTORIES.

For spinning every 100 lbs. of washed wool, 12 or 14 lbs. of oil (mostly olive oil) are required; and extensive cloth manufactories use for fulling 50 or 75 tons of soap, each, yearly. There are, annually, 25,000 tons of washed wool spun in Austria, and almost 3,500 tons of oil are consumed; the oil is valued at two millions and a half florins. This quantity which, until lately, has been entirely wasted, is again separated by fulling with soap. A writer describes a process in operation in Brunn, near Vienna, for saving this waste. It has been in operation for four years, and consists of the following manipulations: The soap water is collected in a reservoir from which it is pumped into a wooden tub. Sulphuric acid of 66° B., diluted with three times its volume of water, is then added under constant stirring, until the soap is perfectly decomposed. The fatty acids rise to the surface and, when cool, are collected, put into bags, and are subjected to high pressure in order to separate the water as much as possible. After a few hours the bags are emptied, and the mass, which in the meanwhile has become consistent, is formed into cakes, to be molten at a temperature of from 350° to 400° Fah. and pressed again. The thus-gained product is mostly used for the manufacture of soap, and it is estimated that the value of the material thus reclaimed amounts in Austria alone to 350,000 florins.

CHEMISTRY IN THE WORKSHOP.

H. W. Behse has just published a book, entitled "Die Chemie in der Werkstatt" (Chemistry in the Workshop) which we should like to see translated. A review says: "Chemistry, more than any other science, is called upon to shed light upon the darkness yet prevailing in many technical manipulations, in order that the manufacturer, guided by theoretical knowledge, may not only operate with more certainty, but may also obviate failures with more reliance. The author has solved this problem in the most meritorious manner."

REFINING GOLD BY CHLORINE GAS.

The application of chlorine to the refining of gold, as some of our readers may be aware, consists in passing a current of chlorine through the molten metal covered with borax. In a few minutes the silver present is converted into chloride, which floats on the surface, while the chlorides of lead, copper, antimony, and arsenic escape. The fineness of the gold produced in this way varies from 991 to 997 in 1,000 parts; the few remaining thousandth parts of the product are silver, a quantity which is less than that resulting from any of the previously known processes. E. Dumas informs us that in the Mint in London as much as 750,000 kilogrammes of gold have been refined and toughened by the process, one kilogramme being 2.2046 lbs. avoirdupois. The apparatus is in use for only three days per month, and the cost of the chlorine gas is only from four to five francs for refining 5,000 kilogrammes of the gold. In order to refine 40 kilogrammes, a current of the gas for five minutes' time is sufficient. The silver is found in the borax covering the gold.

NEW PROCESS FOR EXTRACTING GOLD AND SILVER FROM COPPER PYRITES.

This method, invented by F. Claudet, is based upon the insolubility of the iodides of gold and silver. After the pyrites have been desulphurized by the addition of salt, they are placed in a barrel with a false bottom and lixiviated with acidulated water. The wash water consists of sulphate of soda, chloride of copper, and some chloride of silver. From this liquor the copper may be precipitated in a metallic state by means of sheet iron or iron scraps; but if the noble metals are to be separated, the waters from the three first extractions are collected, and the requisite quantity of iodide of potassium in solution is added to them. After having been left undisturbed for twenty-four hours, the clear liquor is drawn off, the vessel is then filled again, and iodide of potassium is added (in short, the operation is repeated) until a sufficiently large quantity of precipitate has collected. This contains sulphate of lead and copper salts, besides the iodides of gold and silver. The salts of copper are washed out, whereupon the residue is mixed with zinc, in a finely divided form, which combines with the iodine. Hence the result is a mixture of gold, silver, lead, and some oxide of zinc, from which it is easy to separate the noble metals. Claudet produced in 1871, by this process, from 16,300 tons of desulphurized pyrites, 333,242 kilogrammes silver, and 3,172 kilogrammes gold, at a net profit of \$16,160.

DYEING SHODDY WOOL BROWN.

The advantage of the process here described consists in that the operation can be carried out in one vat. One hundred lbs. wool are left for half an hour in a boiling bath containing 30 lbs. yellow wood, 3 lbs. alum, 2 lbs. crystals of tartar, and 1 lb. sulphate of copper. After that time, one pound chromate of potash and three quarters of a pound of a solution of rosain in hydrochloric acid are added to the bath, which is now kept gently boiling. By the addition of turmeric, various shades may be obtained. Logwood will darken them, 6 lbs. of logwood and 10 lbs. of turmeric being recommended for 100 lbs. wool. The term rosain applies to a waste product obtained in the manufacture of aniline red.

DYEING SHODDY BLUE.

In this method, half woolen threads are destroyed by muriatic acid; the acid is then neutralized by chalk, and the fabric is well washed and dyed. One hundred pounds require one pound of chromate of potash, one pound sulphate

of copper, five pounds alum, one pound crystals of tartar, and one pound oil of vitriol, which are dissolved in the vat, the goods being left in the boiling liquor for half an hour. The goods are then boiled in a fresh bath containing 25 lbs. logwood, to which half a pound of "shoddy" carmine and a quarter of a pound of rosain are added, the liquor being left boiling for another half hour. The so-called shoddy carmine is prepared by dissolving in hot water twelve pounds alum, nine pounds indigo carmine, and three pounds of soluble aniline blue, and stirring until cool. This carmine is very suitable for dyeing ordinary wool.

DETERMINATION OF IRON IN BLAST FURNACE SLAGS.

This method is recommended as being free from the objections belonging to the generally known systems of analysis. The finely pulverized slag is mixed in a platinum crucible with three or four times its quantity of fluoride of ammonium. The crucible is first heated in the water bath under gradual addition of sulphuric acid; and when the boiling has ceased, it is heated in the sand bath until the acid commences to evaporate. Upon cooling, water is added; the insoluble residue is put on a filter and washed out, until the washing water ceases to indicate iron. It is now heated in a balloon with some zinc, so that the peroxide may be reduced to protoxide; and when this is the case, the iron is determined by volumetric analysis in the generally known manner.

RECENT PATENT DECISIONS

Locking Nuts.

APPEAL OF PETER CAMPBELL.

LEGGETT, Commissioner.

Applicant fully sets forth his alleged invention in his claim, which is—A nut lock composed of a portion of the metal of the nut, projecting into a recess in one of the threads of the bolt, said recess being formed and the metal forced into it at one operation. It is obvious, upon mere inspection of this claim, that it does not cover a patentable invention. Applicant cannot make such a nut lock as he describes so as to be ready for use or sale in the market. His invention, then, is not a device or article that he can offer to the public as complete for their use. It is only a process that he presents, which every man must apply himself to secure the result contemplated. In other words—every man must make his own fastening, upon the plan proposed, every time he wishes to employ it. The process is not new in all the cases, and that, as shown by the reference cited—patent of A. D. Smith, No. 3,899—is old. There is nothing new or patentable in this application in view of the reference, and the decision of the Board is, therefore, affirmed.

Ladies' Hoopskirts.

APPLICATION OF SAMUEL PEBBERDY FOR EXTENSION OF PATENT NO. 22,197, GRANTED NOVEMBER 30, 1853. DECIDED NOVEMBER 27, 1872.

Extension refused where only five per cent of the net profits to arise from the extended term were to go to the inventor, and ninety-five per cent to assignees.

United States Circuit Court—Southern District of New York.

Machines for Pegging Shoes.

GALLAHUE *et al.* vs. BUTTERFIELD.

Before WOODRUFF, Circuit Judge. In an action by Alpheus C. Gallahue and Eli Bennet against William Butterfield, for the infringement of certain letters patent on shoe pegging machines, granted the complainant, Gallahue, on the following dates, respectively, namely, August 16, 1853, and reissued July 6, 1869; March 29, 1869, and reissued June 22, 1869; and August 26, 1862. Patent sustained. Decree for plaintiffs granted. *Keller & Blake*, for complainants. *G. L. Roberts*, for defendant.

United States Circuit Court—District of Massachusetts.

SMITH vs. NICHOLS.

WM. SMITH'S PATENT FOR IMPROVEMENT IN COILED ELASTIC FABRICS—INVENTION DISTINGUISHED FROM MERE SKILL IN CONSTRUCTION. A suit in equity under the patent involved in the various cases, *Smith vs. Elliott*, same vs. Warren *et al.*, etc., tried heretofore, the claim of the patent in the present case, however, being modified by a disclaimer filed in May, 1872.

The case was heard by Mr. Justice Clifford, of the Supreme Court, and his honor Judge Lowell. Upon the whole we feel constrained to agree with the opinion of the learned circuit judge of the second circuit, that the old webbing was a fabric of like kind with the complainant's, and that the improvement is important though it is, must be held to be due to the skill and sagacity with which the mode of operation, by which that webbing was made, has been adapted and applied by the plaintiff, by the use of better materials and a more careful weaving, but not by the exercise of the invention requisite to enable him to claim the product as a fabric before unknown. Bill of complaint dismissed. *T. A. Jencks*, for complainant. *B. Dean and B. R. Curtis*, for defendant.

The Hop Preserving Patent Case.

To the Editor of the Scientific American: In your issue of 7th December, I find in *extenso* the decision of the Acting Commissioner in the matter of the interference between the application of Benjamin Bates and the patent of Seeger & Boyd. Decisions of the Commissioner have not infrequently contained extra-judicial opinions derogatory to the validity of existing patents. Whatever of evil there may be in this practice is vastly augmented by the greatly increased publicity now given by the publication of these decisions in the *Patent Office Gazette*, the *Scientific American*, and other journals. Extra-judicial opinions are objectionable at any time, and in this case the strength of expression amounts to a grievance. On behalf of my clients, and all other honest patentees, I enter my protest. The patent being already granted, is beyond the jurisdiction of the Commissioner. He can say nothing to impair its validity; but his words may encourage infringement and incite litigation. A patent receives validity only through the signature of the Commissioner; its issue is his act; and for him to assert that a patent is illegal and fraudulent is to stultify his own record. A patent granted is property. To stigmatize as fraudulent that in which a citizen has a vested interest, proclaimed to the country that the right in that property may be lost at will, without any compensation, but the Commissioner has no power to protect such persons as may, ignorantly relying upon official expressions of the Commissioner's opinions, infringe that patent. In the present instance, the Commissioner characterizes as fraudulent, and unworthy to be called invention, a matter which had twice been passed upon by the Examiner, and had passed the Examiner of Interferences and the Board of Examiners in Chief, without any challenge of this sort. In matters of issue, on appeal to the Commissioner, the law makes his judgment of superior force; but in matters of pure and gratuitous opinion, destitute of legal force, such expressions, when officially made, are, to say the least, not in good taste. Misconception of Seeger and Boyd's patent has led the Commissioner into this error of judgment; but it is none the less objectionable on that account. A patent is not invalid because no special skill is required to work it, or because a child can exercise it, or because there is no evidence of inventive genius. Simplicity is generally regarded as a merit rather than a demerit. A patent is not granted for inventive genius, as many have found out,—or for special skill, or for what requires bodily strength; but for some new or improved art or thing wherefrom the public may derive benefit. That the thing claimed by Seeger & Boyd is both new and valuable as an acquisition to trade, is not questioned by the Commissioner; he should have, therefore, confined his decision to the question of priority, which was the only issue before him. R. D. O. SMITH. Washington, D. C., Dec. 3, 1872.

NEW BOOKS AND PUBLICATIONS.

GEMS OF GOLDSMITH. With Notes, Illustrations, and a Sketch of the Author's Life. New York: Samuel R. Wells, 389 Broadway.

An admirably printed edition of "The Traveller," "The Deserted Village," and "The Hermit," with excellent engravings. It will make a most acceptable present for the season, and deserves commendation as a beautiful production of three masterpieces of one of the purest and most elegant of English writers. We should like to see a complete edition of the works of the talented but erratic Goldsmith, published in a style similar to this little book.

Facts for the Ladies.—Mrs. W. Weber, New York, has operated on a Wheeler & Wilson Lock-Stitch Machine twelve years, earning from \$2.50 to \$3.00 per day, in private families; can stitch a dozen linen shirt bosoms and five dozen pairs of cuffs in an hour. See the new Improvements and Woods' Lock-Stitch Ripper.

Inventions Patented in England by Americans.

(Compiled from the Commissioners of Patents' Journal.)

From October 23 to December 5, 1872, inclusive.

- COUPLING CARB.—J. C. Morton, Boston, Mass.
- CUTTING GLASS, ETC.—C. W. Lewis, New York city.
- CUTTING HARD SUBSTANCES.—B. C. Tilghman, Philadelphia, Pa.
- GORING FOR BOOTS, ETC.—C. Winslow, Boston, Mass.
- GRAIN SEPARATOR.—A. Hunter, E. H. Osborn, Quincy, Ill.
- GRINDING MACHINERY, ETC.—A. Assman, Linden, N. J.
- LEVER AND SCREW PRESS.—G. B. Boomer, Syracuse, N. Y.
- MAKING BARROWS.—W. Barr, Jersey city, N. J.
- MAKING BRICKS.—I. Gregg, Philadelphia, Pa.
- MAKING GAS, ETC.—T. A. Howland, C. G. McKnight, Providence, R. I.
- MAKING IRON TUBES, ETC.—E. Wheeler, Philadelphia, Pa.
- MAKING STEEL.—T. Brooks, Minerva, Ohio.
- MALLEABLE CAST IRON, ETC.—J. M. Roberts, Burlington, N. J.
- MOTOR FOR SEWING MACHINES, ETC.—G. W. Manson, New York city.
- PISTON PACKING.—J. C. Furness, Boston, Mass.
- PRINTING MACHINE.—E. L. Ford (of Brooklyn, N. Y.), London, England.
- PRINTING, PRESSING, ETC., MACHINES.—E. L. Ford, New York city.
- PRINTING TELEGRAPH.—E. Gray, E. M. Barton, Chicago, Ill.
- PUMPING ENGINE.—E. Cope, J. R. Maxwell, Cincinnati, Ohio.
- RAIL JOINT.—J. McL. Staughton, Riverton, Ky.
- RAISING SUNKEN VESSELS.—H. F. Knapp, New York city.
- ROCK DRILL.—A. C. Rand, J. B. Waring, New York city.
- SEWING MACHINE, ETC.—J. L. & D. H. Coles, New York city.
- SEWING MACHINE.—R. Whitehill, New York city.
- SHEET METAL CANS.—G. H. Chinnock, Brooklyn, N. Y.
- SHOE PEGS.—J. H. Oliver, M. D., Baltimore, Md.
- SHUTTLE SPOOL.—T. H. Dodge, Worcester, Mass.
- SPINDLE BOLSTER.—C. F. Wilson, J. E. Folk, Brooklyn, N. Y.
- SPINNING MACHINERY.—E. Freeman, Norton, Mass.
- STEAM PUMP.—W. C. Selden, Brooklyn, N. Y.
- STENOGRAPH.—N. Thompson, Brooklyn, N. Y.
- TELEGRAPH.—S. F. Van Choate (of Boston, Mass.), London, England.
- UTILIZING HYDROCARBONS, ETC.—P. F. Goodrich, San Francisco, Cal.
- VENTILATOR.—S. C. Maine, Boston, Mass.
- WATERING LOCOMOTIVES.—W. E. Prall, Washington, D. C.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

WASHING MACHINE.—George Washington Mollineux, Marble Hill, Mo.—The invention consists of a pair of horizontally reciprocating washing or rubbing boards, suspended adjustably from slides upon the cover, with their rubbing surfaces on the under side, to work on the top of the clothes, which rest on a stationary ribbed board, and the sides of the tub are provided with vertical ribs for acting upon the clothes. The rubbing boards are suspended from a vertically adjustable cross head, mounted on rods rising up from the slides, and held down upon the clothes with the required pressure by friction pawls on the cross head, held on the rods by springs. The slides are worked by a lever pivoted to the top of the tub between them, so as to work them simultaneously in opposite directions. The top of the tub is hinged at one end, and held fast at the other end by a yoke, which is readily disengaged to allow the top to be lifted. The slides and rubbers swing out of the tub when the cover is raised, to facilitate the adjustment of the clothes.

WASHING MACHINE.—Ira B. Stillman, Almend, N. Y.—This invention relates to that class of washing machines in which the washing is performed by passing the clothes between a set of rollers held to their work by spring power; and it consists in the construction of the pressure spring, whereby a greater range of elasticity is effected than has been gained by springs heretofore used, and in the manner of adjusting the said spring to the different degrees of pressure required. It also consists in a device whereby the machine may be readily and securely attached to and conveniently detached from the tub or other vessel in connection with which it may be desired to be used.

BLOTTING, RULING AND CUTTING IMPLEMENT.—Hugh S. Ball, Spartanburg, S. C.—This invention has for its object to furnish an improved ruler, blotter and paper cutter combined, which shall be so constructed that it may be used with as much facility as a ruler, blotter, and paper cutter as if it were constructed especially for each of said uses. It consists in a plate of light sheet metal, of suitable length and breadth, the sides of which are bent downward so as to hold in a semi-cylindrical form a sheet of India rubber which is covered with blotting paper. A narrow strip of metal soldered to the sides of the device serves as a paper cutter. When the blotting paper becomes soiled it may be easily replaced.

WASH BOILER.—Wellington H. Lines, Cannonville, N. Y.—This boiler is designed to cleanse the clothes by means of boiling water elevated by means of steam pressure and discharged upon the top of the clothes. The operation is as follows: Water or soda sufficient in quantity to fill a lower compartment is introduced into the boiler, which passes down through a valve tube. The clothes are then put in. When heat is applied to the bottom of the boiler and steam generated, the ball valve will be forced up and will close the top of the tube, and the water will rise in the outside tubes and be discharged on top of the clothes. This water will pass down through the clothes, and will accumulate on the bottom till it will in a few seconds overcome, by its weight, the pressure of steam on the valve. The latter will consequently fall, and the water will return to the lower compartment. When the steam accumulates the valve will be again forced up and close the top of the tube, and this intermitting action will be repeated every few seconds. No water is allowed to pass upward except through the outside tubes. This action is kept up as long as may be required to thoroughly cleanse the clothes.

WATER ENGINE.—James H. Connell, Elizabeth, N. J.—This invention consists of an arrangement of the piston rod for filling up the space in the cylinder to economize water. It also consists in an arrangement of the piston and piston rod packing to simplify the cost of construction and utilize the water pressure for packing. It also consists of a combination of a valve and pipe connection with the valve chest, whereby the flow of water may be directed through it while the crank is passing the dead centers, so that the shocks common to the ordinary engines by the sudden stoppage of the water column will be avoided; and it also consists of the combination of an air chamber with the valve chest of a water engine, also with an escape valve for neutralizing these shocks more completely than can be done with either alone.

ROTARY ENGINE.—Truckson S. La France, Elmira, N. Y.—The invention relates to the packing pieces which are affixed to the ends of cogs in rotary engines, and consists in a peculiar construction and application thereof. By making the piece wider at the bottom than at the top, the inventor obtains extra surface, against which the steam may act, thus insuring a positive movement. The piece being beveled is loose, movable, and cannot stick fast when the expansion takes place. While the cog wheel is running in hot steam the packing piece is pushed down into the groove, and when the wheel is contracted by cooling, the springs push the pieces out against the case. Thus it is tight under all circumstances. This cannot be accomplished with a straight packing piece.

REFRIGERATOR.—J. Hyde Fisher, Chicago, Ill.—This invention relates to a new and useful improvement in refrigerators, having particular reference to a refrigerator for which letters patent of the United States were granted the inventor, dated August 1, 1865, and reissued the 31st day of January, 1871, which present invention consists mainly in an air space beneath the ice chamber, in the double bottom, between the ice chamber and the refrigerating or provision chambers, the lower portion of the bottom being of wood and the upper portion being metal. The air space being separated from the ice by only the metallic portion of the double bottom, the air therein partakes of the temperature of the ice, and assists in keeping up the circulation.

**CASE FOR WRITING MATERIALS.**—George B. Chase, Austintown, Ohio.—This invention relates to a new case or box for the reception of pen, ink, paper, etc., and consists in providing a groove under the bottom of the narrow box for the insertion, transversely, of the cover, so that the cover will, when the box is opened, aid in supporting the box in an upright position.

**RAILROAD RAIL JOINT.**—Thomas Slaughter, Lawrence, Mass.—This invention is designed to fasten the fish plates and rails of railway joints together and to serve as a substitute for bolts and nuts. Holes are cut through the plates, flared large at the openings. In these are inserted gibs, and, within or between the gibs, wedges are driven so as to bend the gibs against the tapering wall of the hole. The tapering ends of the gibs are bent around the keys to prevent their working out.

**CONNECTING ROD.**—Samuel N. Wate, Jr., Danville, Pa., assignor to himself and P. J. Adams, of same place.—This invention has for its object to improve the construction of the connecting rod described in letters patent No. 128,831, granted to the inventor and P. J. Adams, July 9, 1872, so as to make it simpler in construction and neater in appearance. A long strap passes around one end and along the side edges of the body of the rod. A short strap passes around the other end of the rod, and its ends overlap the ends of the long strap. A bolt or bar passes through slots in the end parts of the long strap through holes in the end parts of the short strap, and rests in a slot or notch in the end edge of the main body of the rod, and is secured in place by nuts. Bolts, one or more of which may be used, pass through holes in the strap and through slots in the rod, so that the said rod and strap may be moved upon each other in opposite directions and still be secured by said bolts. A small block is interposed between the overlapped ends of the straps and the end of the rod, and against which the inner brass at that end of the rod rests. A set screw passes through a screw hole in the center of the bolt in line with the length of the rod, the middle part of the end of the rod being cut away to receive it and allow it to be operated. By movement of this set screw, in combination with other mechanisms, the straps are drawn toward each other, drawing the outer brasses inward just as much as the inner brasses moved outward, thus taking up the wear while keeping the pins at exactly the same distance apart.

**PAPER FOLDING MACHINE.**—Alyah Washburn, Medina, Ohio.—This invention consists of a series of light folding frames hinged on the top of a table, and provided with operating gear actuated by a cam shaft, which said frames are arranged in such order and sizes relatively to each other that a printed sheet delivered on the table over all the folding frames by the depositors of a printing press will be folded in the order of folding it by hand, and thrown off the machine by another frame similar to the folding frames. The said machine is operated by the printing press from which it receives the sheets as they are printed.

**PLATE AND SHEET GUIDE FOR ROLLING MILLS.**—James Moore, Belleville, N. J.—The object of this invention is to attach to rolling mills a device whereby the curling of the plates or sheets when they emerge from between the rollers will be prevented. At present it frequently and almost invariably happens that the plates or sheets curl up as they emerge from between the rollers which makes it more difficult to subsequently handle them and often threatens the destruction of the entire machinery, or injury thereto. In order to counteract this tendency of the plates to curl, a pendulum lever is applied to the machine, with a foot at its lower end that reaches to the plate and holds its end down, following the motion of the plate as the same passes out of the rolling mill.

**COAL CHUTE.**—Cornelius W. Williams, Port Jervis, N. Y.—The pocket of the chute, in this invention, is to be elevated sufficiently for spouting from it into a wagon. The lower portion of the spout is hinged so as to fold up out of the way, so that a wagon can be drawn close alongside without being obstructed. A cross bar is suspended in front of the lower end of the spout for the coal to strike against, and be thereby turned directly downward to prevent it from shooting over the side of the wagon. A series of grate bars is arranged at the bottom of the spout to screen the coal as it flows from the pocket to the wagon.

**RAILROAD FROG.**—James Brahn, Jersey City, N. J.—The invention consists, first, in slotted iron blocks with wood filling between point and wings or between the wings. This construction greatly facilitates the putting together of the frog, as the blocks can be driven in till they fit, and then holes to receive the bolts can be bored through the wooden blocks through the holes in the wings and point. The wooden blocks alone bear the strain, and thus allow the point and wings to be drawn together more firmly and held more securely. The wood, by its spring, takes up the wear, and serves as a cushion to prevent jar and noise from the wheels. The wooden parts of the blocks thus do the work, while the iron parts strengthen the wood, and protect and preserve it from decay and from losing its elasticity. Second, each fish plate is made in two parts, which can slide upon each other. The inner part has two round holes formed in the end that is bolted to the end of the frog, and two short slots in the ends that are to be bolted to the end of the rail. The outer part of each fish plate has one round hole formed in its outer end to receive the outer bolt, and three slots to receive the other bolts. This construction enables the fish plates to be readily adjusted and secured to the ends of the rails of any road, and so long as one of the bolts remains tight the rail cannot move. The tread of the wheels, especially the drive wheels of the engine, is made considerably wider than the head of the rails, and by use becomes hollowed along the flange, so that the outer edge of the wheel, when running upon or leaving the point of a frog, will strike the other rail of said point and chip it out and injure it. To remedy this a solid iron block is placed between the rails of the point at the place where the outer edge of the wheels strikes or leaves the rail of the point, so that the outer part of the tread will be held up level with the top of the rail when passing upon or leaving it.

**BLACKBOARD.**—Frank G. Johnson, New York City.—This invention relates to a new and useful improvement in blackboards for schools and for all the purposes for which the ordinary blackboard is used; and it consists in a series of plates or tablets and in a grooved frame or case, in which grooves the tablets slide. When five (more or less) tablets are combined in the case they require no more wall space than a single one. A problem may be demonstrated on the outside of the first tablet; and it may be turned over and the other side used; or it may be drawn out so as to expose another tablet and laid away, or drawn in either direction so as to expose the next tablet or a part of it, and still remain in the case; and so of all the tablets. The case is designed to hang upon the wall.

**COFFEE POT.**—Martin Hoffman, San Francisco, Cal.—This invention has for its object to furnish an improved coffee pot, extracting the strength so thoroughly from the ground coffee that a much smaller quantity will be required than when an ordinary coffee pot is used. The upper part of the body of the coffee pot is made cylindrical in form, and the lower part is bulged or swelled. The bottom of the pot is concave so as to more thoroughly concentrate the heat. A funnel rests upon the bottom of the body and its tube enters the tube of another funnel which is placed at the lower edge of the cylindrical part of the body and connected with and supported from the first named funnel. The steeper is fitted into the mouth of the cylindrical part of the body, and its bottom is finely perforated or made of fine wire gauze. In the center of the perforated bottom of the cup or steeper is formed a hole, in which is secured a tube through which the tube of the upper funnel passes, and which is made a little larger than said funnel tube, so that steam may pass up between them. A perforated plate with a hole through its center is designed to be placed upon the coffee in the cup and hold it down evenly and smoothly, so that the water may set upon and leach the coffee evenly. In using the coffee pot, the ground coffee is placed in the cup and the plate placed upon it; then, as the water becomes heated, it is forced up through the tubes, flows upon the plate, and percolates through the coffee, wholly removing its strength in a very short time, the plate and cup catching any fine coffee that may pass through the bottom of the cup, so that the coffee will always pour out clear.

**LEVER FOR LATCHES.**—Charles C. Lewis, Gainesville, Ala.—This invention relates to an attachment to door knobs, whereby the latch mechanism is brought within reach of small children, who can thus open the doors. The invention consists in a knob lever constructed with jaws and held by a key, and in providing a knob lever with spring and cord, and arranging it horizontally in a stop box.

**TURBINE WATER WHEEL.**—Thomas J. Alcott, Mount Holly, N. J.—This invention consists in the construction of an inside cylinder, with chutes and vertically adjustable guides, combined with an outside case. The object is to prevent the wear of the cylinder, to cause less friction, and make a perfect watertight joint. The inside adjustable cylinder has chutes or openings corresponding with the chutes or openings of the outer stationary case, the outer case being made of one solid casting with the lower half or curb smaller in circumference than the upper part. The upper part has twelve (more or less) openings, and between each opening and on the inside of the outer cylindrical case there are recesses for the purpose of passing off any sand or gritty substances that might collect between the cylinders, and causing less friction. On each side of each recess there are brass or Babbitt metal bearings to prevent the wear of the cylinder, making a perfect watertight joint. The inner cylinder is adjusted horizontally back and forward, so as to graduate the flow of the water passing through the openings of the outside cylindrical case, thus diminishing the size of the openings or closing them perfectly whenever required, and the inner cylinder is also adjusted vertically by the tightening or loosening of the nuts of the bolts or guides that pass through the top of the case and the cross arms of the top of the inner cylinder, the arms being below the cover of the case; and the center circular plate works backward and forward against and around the lower part of the dome of the top. For further particulars see advertisement on another page.

**CRADLE, CRIB, AND STANDING STOOL COMBINED.**—Calvin E. Nurse, Chesford Factory, N. H., assignor to William W. Hopkins, of same place.—This invention has for its object to furnish an improved combined cradle, crib, and standing stool, which shall be so constructed that it may be conveniently adjusted for use in either capacity, and which may be compactly folded for storage or transportation.

**BEE HIVE.**—William R. Clark, Piqua, Ohio.—The object of this invention is to provide convenient, safe, and efficient means for wintering honey bees. Through the cap, which is made to fit the top of the hive above the honey frame and is filled with straw, is formed a channel or passage way which is in communication with the alighting board in front. The filling is kept in place by two or more cross pieces, and is lined with woolen cloth or other material. The bottom or platform of the cap is composed of slats and clamps, and rests upon the top of the body of the hive, and is nearly covered inside with woolen cloth, which may be saturated with brine or other solution. The bees have free access to the passage way or channel, and from thence to the alighting board, and are thus allowed to feed in winter from one comb to another. The end clamps are grooved to the ends of the slats, where they are fastened in any suitable manner. The alighting board is attached to the clamp and may be removed therewith at any time. A ventilator and a shutter, one or both, may be closed down over the bee orifice of the alighting board, as may be desired. The filling absorbs the moisture, and, together with the lining, the natural heat of the bees is retained. The bees have free access from the honey frames of the hive to the channel in the cap, and from thence on to the alighting board. The honey frames are confined to the frame by a strap or metallic hook. The shutter may be elevated more or less, leaving the ventilator closing the entrance, thus enabling the ventilating air current to be controlled, while the escape of the bees is prevented. A small current is maintained through the entrance, and up through the filling and openings in the top, thus carrying off the moisture and relieving the brood chamber of foul air or odors.

**LAMP CHANDELIER.**—Randolph S. Mains, New York City.—The chandelier is so suspended that it may be raised or lowered, as may be required, and may be made and used either with or without a shade. With the common kerosene lamp in this chandelier, all the advantages of the expensive extension gas chandelier are secured with this additional advantage—the light may be readily removed and utilized away from the chandelier.

**TREATING PETROLEUM.**—Emil Schalk, New York City.—This invention consists of a continuous process of treating the distillate, by which much time and labor will be saved. Instead of having a tank and filling it with oil, and then adding the sulphuric acid, the oil and the acid, in the right proportion, are allowed to run in a continuous flow into a horizontal agitator, where it is agitated for a certain time, allowing the product to run out at the other end into a series of small tanks, filling one after the other and allowing the first to be emptied before the last is filled. From each tank the distillate is run into another horizontal agitator, where the washing is carried on in the same continuous way as when treated with acid, and in like manner it is again discharged into tanks, and from there into a third agitator to be treated with alkalies, and then washed again.

**RAILROAD SWITCH LOCK.**—James L. Anderson, Bucyrus, Ohio.—This invention relates to a new means for locking the switch levers on railroads, automatically and effectively. The invention consists in providing the switch lever with an up and down adjustable transverse bolt, which will drop into notches of the arcs between which the lever can be moved. The invention also consists in combining with the aforementioned key a projecting ear on the lever, a vertical drop bolt for locking into it, and an ordinary key for raising the drop bolt and liberating the lever when desired.

**DUMPING WAGON.**—Charles G. Taft, Triangle, N. Y.—The object of this invention is to furnish a wagon for transporting and unloading stone and similar material. The sides of the body are rigidly attached to the bolster and to the rear axle, so that they are immovable. The end boards are rigidly attached to the bottom. An iron rod, secured at the ends, passes through the two end boards, and rests upon the inside of the bottom in the middle of the wagon. The bottom and ends being thus supported by this rod, are allowed to turn thereon in either direction. On each side of the wagon box, and working in a slot in the side board, is a cam lever, so arranged that the cams come just above the bottom when the levers are turned up to the side boards. When one of the cams is turned up, the bottom will turn and dump the load; but when both cams are turned in, the bottom is secured in a horizontal position, and may be loaded with stone or other material, and in this condition the load may be moved or transported, and then dumped on either side, as may be desired.

**ORE JIGGER.**—Johann Friedrich Utsch, Iserlohn, Germany.—The object of this invention is to produce an automatic discharge for jig machines whereby the several grades of ores will be discharged according to their specific gravity without reference to size. The invention consists in the application to the jig sieve of two, three, or more discharge pipes, whose upper ends project at various distances above the sieves, so that during operation the heavier parts of the ore will be discharged through the pipe projecting least, while the lighter grades, forming higher strata on the sieve, will be discharged through the pipes projecting higher.

**AUTOMATIC CAR BRAKE.**—John E. Worthman, Mobile, Ala.—The invention has in view to connect all the brakes of a train with a mechanism on the tender, or on the truck of any car. It consists in the mode of tripping the spring rack, which locks the brakes, so that the latter will be at once allowed to assume a position out of contact with the wheels. It also consists in a novel mode of automatically unengaging a drum winding pinion from an endless screw which rotates it, so that the brake lever will be locked at a given point and the brakes operated with a given pressure. It also consists in a novel mode of regulating the time when the unengaging of said pinion from said endless screw shall take place, so that greater or less force may be applied. It also consists in the general method of operating all the brakes of a train of cars simultaneously and with a uniform force. In going down an incline, the acquired momentum produces an immense strain upon the costly engine and racks, and greatly lessens its durability, because the brakes are applied at different times by the several brakemen. This is avoided entirely by using simultaneous brakes.

**Plow.**—Henry C. Godfrey, Elizabeth City, N. C.—The invention relates to that class of plows which are employed in the cultivation of cotton, especially in its early growth. The invention consists in a scraper formed of two parts, one of which serves to run an inch (or a fraction thereof) beneath the surface of the soil and thus to cut up the weeds, while the other serves as a cutter, but mainly as a guard, to prevent the loose soil from falling over on the plants. Secondly, the invention consists in the arrangement of a small turn plow on the side, to the rear of the front, and above the bottom of the landside of a larger plow, so as to follow the scraper and throw clean soil to the stems of the young cotton plants. Thirdly, the invention consists, finally, in the mode of attaching the small plow to the landside of the larger one.

**BLOW-OFF FOR STEAM BOILERS.**—Buckingham C. Nye, Pomeroy, Ohio.—The invention relates to that part of a boiler which is immediately above the fire, which is accustomed to become covered with scale and sediment, and which is thereby rendered liable to rapid oxidation, to diminution in strength, and to the production of explosions. The invention consists in two horizontal tubes having each a continuous slot on the bottom, and emptying into a central vertical discharge tube which is open at the bottom, to produce an upwardly perpendicular current directly therethrough.

**WAGON BRAKE.**—George W. Jackman, Bath, N. H.—The invention consists in forming an automatic brake of a bar pivoted near to the end of a tongue and jointed to a brace hinged to the axle, whereby the holding back of the animals applies the brake. It also consists in a peculiar mode of curving the bar, and jointing it to the brace so as to give relief to strain upon the necks of the animals.

**VERTICAL BOILER.**—Philip Estes, Leavenworth, Kansas.—The invention relates to a vertical boiler, more especially designed for heating hot houses or other buildings with hot water. It consists, first, in constructing the boiler and furnace in three easily detachable sections, whereby the commonest mechanic can take it apart, clean, and again put it together. It consists, secondly, in providing the crown sheet with cups and circulating tubes that hang down in the fire chamber, to facilitate the heating operation.

**MACHINE FOR CUTTING FABRIC INTO PIECES FOR BAGS.**—William J. Cussen, Richmond, Va.—The invention consists in a spring clamp swiveled to the side of a table, holding together the fractional parts of a previously cut piece while others are being unfolded, and turning to one side when its function has been performed.

**DOFFER STRIPPER.**—A. M. Comstock, Holden, Mass.—The stripper is provided with teeth beveled on one side, and is arranged so as to support the stock or roving between the card cylinder and condensing rolls, and deliver it to the latter in a peculiarly effective manner. It is especially adapted for use when short stock is being worked up.

**CULTIVATOR.**—William D. Smith, Homerville, Ga.—This invention has for its object to furnish an improved cultivator, so constructed as to stir up the soil to any desired depth without turning up the fertilizer to the surface and to avoid having its gases evaporated by the rays of the sun. The bar or beam to which the plows are attached is made in zigzag form, to form shoulders or offsets for the attachment of the plows. The rear part of the draft bar or beam is bent or curved upward, and has a hole formed in its upper end to receive the round that connects the handles and holds them in their proper relative positions. The ends of the zigzag bar or beam are supported by the brace rods, the rear ends of which are secured to the ends of the said bar or beam, and their forward ends are secured to the forward part of the draft bar or beam. The plows are made long and narrow, are curved or bent downward and forward, and are twisted so that their forward sides may be slightly inclined to allow the soil to slide off the said plows as they are drawn forward, thus enabling them to stir up the soil thoroughly and move it toward or from the plants as may be desired. The zigzag bar or beam may be made of any desired length, and may have any desired number of shoulders or offsets for the attachment of plows.

**BILLIARD TABLE.**—William H. Griffith, New York City.—This invention relates to a new manner of bracing and sustaining the top of a billiard table. Such top is now usually made of slate or other mineral substance in three or more slabs, which are placed side by side upon the supporting frame, and is liable to sag in the middle, especially on tables having but four legs, and also to open the joints between the several slabs or pieces of slate. Either of these occurrences would virtually destroy the billiard table. The invention consists in the arrangement of metallic bars, which connect with the end slabs and press under a middle bridge of the billiard table, serving to draw the slabs firmly together, and also to hold the middle of the table up, and thus keep the top level. This invention is the conception of an extensive billiard table manufacturer, and is intended to greatly improve the strength of the table.

**SASH HOLDER.**—William Branch and Mark J. Liddell, Laingsburg, Mich.—The object of this invention is to furnish convenient and efficient means for holding window sashes in any desired position when raised, and for fastening them securely down when closed; and it consists in a weighted lever with a double cam attached thereto, one of which cams being arranged to hold the sash up and the other to hold it down.

**BARBER'S CHAIR.**—Francis J. Coates, Cincinnati, O.—This invention has for its object to furnish an improved barber's chair; and it consists in the arrangement of devices so that by operating a foot lever the seat may be reversed when it has become warm from use, or set at different angles when desired, and so that the pivoted back will adjust itself to the angle or position of the seat and the back of the sitter.

**SHOEMAKER'S TOOL.**—Joseph F. Ober, Mount Desert, Me.—This invention has for its object to furnish an improved combination tool, designed more especially for shoemaker's use. In using the tool the upper is grasped with the pinchers and drawn into place. The tool is then reversed while being raised, and with a blow, as if with a hammer, the awl is driven into place. A peg is then taken from the mouth and inserted in the hole and driven into place by a blow with the hammer, the tool being reversed in the hand while being raised to give the blow. In this way the shoe may be lasted without laying down the tool, except at the toe, when it is laid down to shake off the folds of the upper to make it lie smooth.

**SUCKER ROD ELEVATOR.**—Lewis K. Stitts and Solomon R. Dresser, Parker's Landing, Pa.—This invention relates to the pumping machinery of oil and salt wells, and consists in a device for elevating the sucker or pump rod. The elevator consists of a box or frame made in two parts. One part opens as a gate to allow the sucker rod to be slipped in or out. Pivots or journals are formed on or pass through the two parts of the box or frame. Bails are attached to the pivots and a stop plate is fixed on the outside of each of the two parts of the box or frame. In sending the elevator to the swivelman up in the derrick, both bails are put on to a hook of the sucker rod line, leaving the gate of the elevator open, so that the swivelman has nothing to do but to slip the elevator under the shoulders of the sucker rod and shut the elevator gate.

**CAR COUPLING.**—Erwin C. Hubbard, Green Bay, Wis.—This invention has for its object to furnish an improved car coupling, which will couple itself as the cars are run together. In the forward end of the bumper head is formed a mouth or recess to receive the coupling link. The coupling hook is a bar having a hook formed upon each end. The bar is placed in a slot in the upper side of the bumper head, the forward hook of said bar projecting downward into the mouth or throat of the bumper head, and its rear hooks projecting downward into a slot or recess in the middle part of the bumper head so as to sustain the draft strain by resting against the solid part of the bumper head between the said hooks. The hook bar is held down into its place by a spring laid in a groove formed to receive it in the upper side of the bumpers, which is kept from moving longitudinally, and which enters a recess in the said bumper head. The spring is held down in its place by the edge of the rear end of a shield, which is made hollow and open at its front end, and serves as a guard to prevent the hook from being pressed down or jammed, so that it cannot be raised by the entering link, and as a guide to prevent the bumper head from lifting.

**HOOK FOR UMBRELLAS, ETC.**—Sigourney Wales, New York City.—This invention relates to a new device for locking the wire springs which support the sliding tubes or sleeves, on which umbrella sticks are held in position, referring more particularly to the lower spring by which the umbrella is held closed. The invention consists in the combination, with the said wire spring, which is of ordinary construction, of a sliding slotted tube within the umbrella stick, and of a spring connected with said tube, and of a key for setting said tube so that the umbrella cannot be opened without said key.

**SEWING MACHINE TABLE ATTACHMENT.**—John C. Egly, Philadelphia, Penn.—This invention relates to the application of a hinged extension leaf containing two drawers to the table of a sewing machine, one of the drawers containing a pivoted self-balancing trough or vessel, which will always be right side up, whether the leaf attachment is swung up or down; while the other drawer has two slide covers, of which the one on top is or should be used in the corresponding position of the leaf.