

ENGINEERING INVENTION.

A fish plate has been patented by Mr. Camille Licardie, of Clermont, De San Marcos, Guatemala. It is designed for use with railway rails, to be fastened longitudinally by the fish plates, each of which has on each end a downwardly projecting tooth fitting loosely into a corresponding aperture in the base of the rail.

AGRICULTURAL INVENTIONS.

A horse hay rake has been patented by Mr. Julius H. Bally, of Paradise Hill, Ohio. It is designed to gather the hay and discharge it in a line parallel with the line of travel of the machine, and at right angles to its axle, the invention covering various novel features of combination and arrangement of parts.

A planter has been patented by Mr. Alfred W. Black, of Traverse City, Mich. It is for use with potatoes or other sets, and is made with two jaws to be forced in the ground a regulated depth, the jaws being separated at the bottom to allow the contents of the planter to drop therefrom, the device also serving to gauge the distance for the next hill.

MISCELLANEOUS INVENTIONS.

A whip has been patented by Mr. Patrick S. Harrington, of Cheyenne, Wyoming Ter. This invention covers an improvement in the process of manufacture, consisting in wrapping an elastic stock with raw hide, together with a method of treating the hide before applying to the stock.

A wagon brake has been patented by Mr. Fred Rice, of Shopiere, Wis. It is constructed and arranged to be operated by the neck yoke, and so that the brake blocks will not interfere with the free backing of the wagon, the invention covering novel features of construction, combination, and arrangement of parts.

A clasp has been patented by Mr. James H. Conaty, of West Haven, Conn. The "cast off" finger or tongue of the clasp is formed from a part of the body of one of the jaws or members of the clasp, whereby the clasp can be produced with less labor than those of the usual construction.

A glass cutting table has been patented by Mr. Alonzo Hughes, of Orlando, Fla. One end of the table is provided with feeding and gauging devices, and the other end has a plain surface and straight-edged end upon which the glass may be broken, with other novel features, for facilitating the work of the cutter.

A dumping grate has been patented by Messrs. Peter Rensland and Charles Fisher, of Port Jervis, N. Y. The construction is such that by rotating a longitudinal shaft the grates may be turned at any angle to the frame, or they may be turned completely over and the faces used alternately, while the parts are interchangeable.

A fruit jar fastening has been patented by Mr. William Brace, of Washingtonville, Ohio. This invention covers a peculiar construction of cover and fastening ball, the ball being swung over the cover in locking the latter down by a roller riding in a groove, and forcing the cover down with an elastic pressure until the locking position has been attained.

Dental foil forms the subject of a patent issued to Mr. Thomas J. Henry, of New York City. This invention covers a sheet of dental foil having depressions causing breaks or punctures in the continuity of its fiber, and not mere superficial indentations for purposes of ornamentation, the punctures forming an important element in softening the foil.

A shoe heel has been patented by Mr. Antoninus Farina, of New York City. It is designed to have the appearance of being made, except for the heel tap, of a single thickness of leather, while wearing as the ordinary built-up leather heel, the construction being such that the tap may be readily removed when worn and another substituted without removing the heel from the shoe.

A spoke drawer has been patented by Mr. John M. Germann, of New York City. It has a main bar adapted to bear on and grip one edge or face of a spoke, with a stirrup for gripping the opposite edge, and a thrust bar adapted to bear on the wheel hub, making a simple and inexpensive device for quickly and easily drawing the spokes from light or heavy wheels.

A street and station indicator for cars and stages has been patented by Mary J. Watson, of Sacramento, Cal. It consists in a series of cards arranged to turn on a common pivotal wire, each card having two sets of names oppositely arranged with respect to each other near opposite edges of the card, the cards being of suitable size to admit of being inverted.

A wagon axle has been patented by Mr. Nathan W. Blewens, of Aurora, Tex. The invention covers an axle combined with a spindle whose shank has a threaded inner end, with nuts turned thereon on opposite sides of the inner seat, by which the spindle may be adjusted to and held in any desired position, and the wagon set to standard or narrow gauge as desired.

An oven has been patented by Mr. Levi Coke, of Elmira, N. Y. It is for bakers' use, and has three lower compartments, an upper compartment, a central fire in the top, and other novel features, affording means for uniform heating and keeping the shelves free from dust and smut, and wherein the shelves are arranged handily, while the oven will be free from gas and smoke.

An apparatus for coloring or bleaching cured or dried tobacco has been patented by Messrs. James K. Hardwicke and James J. Redmon, of Marshall, N. C. It consists of a structure with transparent or translucent outer wall, an inner light-reflecting wall, with plant or leaf supports or racks, whereby the

tobacco will receive both direct and reflected light to give it a uniform color.

A nut lock has been patented by Mr. Marshman H. Phillips, of Verschoyle, Ontario, Canada. Its body is substantially rectangular in form, and constructed of malleable iron, being designed as a simple and cheap construction of nut lock for railroad rails, to effectually secure the heads or ends of the bolts securing the fish plate, and forming a device which may be conveniently removed when a rail is to be replaced.

A pneumatic annunciator has been patented by Mr. William R. Ostrander, of Brooklyn, N. Y. It has an alarm train provided with a toothed wheel, a toothed bar arranged to engage with the toothed wheel and formed with an elongated slot through which is passed a supporting pin, an operating bar, and connections, the parts being so arranged that the resetting of the drops will rewind the alarm attachment.

An apparatus for steaming cloth and other fabrics has been patented by Mr. Voorhees T. Van Fleet, of Somerville, N. J. It has perforated steaming beams constructed with a series of longitudinal compartments arranged one above the other and provided with steam inlets and outlets at different heights, with other novel features, the apparatus being adapted to readily work on different kinds and thicknesses of goods.

SCIENTIFIC AMERICAN BUILDING EDITION.

MAY NUMBER.—(No. 31.)

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Notes & Queries

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

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

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(1) E. K. asks: 1. Is there anything I can use besides borax for soldering gold jewelry, for when you heat that it pushes the work away, or could I put anything in it to keep it from moving the work away? I use one kind of gum, but it is of not much use. Is there a substance which will stick the work to sheet iron, so when it is heated it will become hard, and thereby hold the work, so the borax in evaporating its water will not move the work away when soldering it? A. Use borax glass finely powdered and mixed with water, to form a thin cream. Borax glass is prepared by fusing borax. 2. What can I put in an alloy of gold and copper so as to make it hard? A. Try a small percentage of tin.

(2) M. S. asks: 1. Is it absolutely necessary that the winding of the coil on armature of simple electric motor should be in even and parallel lines? A. It will not be fatal to the working of the machine if the coils are not absolutely perfect. High efficiency in the working of the motor can only be secured by careful attention to all details. The coils should be made compact, and the winding should be even and parallel. 2. Could the motor be used as a dynamo by making changes, and what change would be necessary? A. To make a dynamo upon this principle, it is only necessary to use finer wire on the armature, and make the field magnet of cast iron. 3. Would it then furnish electromotive force sufficient to run a 16 candle power lamp? A. We think it is hardly sufficient to run such a lamp.

(3) L. R. M. asks: 1. Can the simple electric motor described in the above paper for March 17, 1888, be run by Grenet storage batteries, or if not, how can it be made to, also by what other ones besides the one mentioned in the article, can it be run? A. The motor referred to can be operated by any battery or arrangement of batteries that will yield a current of 12 volts and 6 amperes. 2. Also can the said motor be made into a dynamo, and if so, how? Also how many one candle power lamps would it supply, and how much power would it require? A. See reply to M. S.

(4) G. L. D. asks: Will you kindly inform me through your paper if simple electric motor, if connected with an Edison dynamo, will run a 9 inch swing iron lathe? If not, would it increase the power by doubling the width of armature, also that of magnet, and winding it the same with No. 16 A. W. G. cotton-covered magnet wire? A. The motor, if properly wound, is of sufficient size to run such a lathe, doing light work, but the armature should be wound with finer wire.

(5) J. A. V. writes: 1. I have just completed an induction coil having about 2,400 feet of wire, No. 36. How many quart bichromate potash cells can be used? A. If your secondary wire is properly insulated, you can probably use about 6 cells of plunging bichromate battery, with zinc and carbon plates 3x6 inches. 2. The coil is constructed with a draw tube. Must the primary coil fit exactly in the draw tube or not? A. The distance between the primary coil and the core and the primary coil and the secondary wire should be only enough to admit of proper insulation. 3. Is there any difference in currents, if there are four layers of wire on primary coil? A. There will probably be no advantage in using four layers of wire.

(6) G. D. writes: I have tried the magnetizing influence on my watch, and can say that my watch will not run, and am at sea to know what to do in order to demagnetize it. Would you please be so kind as to tell me what to do? A. Place your watch in a coil of 2 or 3 ohms resistance, connect the coil with a plunging battery, reverse the current rapidly as the battery is plunged, and also while the elements are being withdrawn from the solution. Test your watch by bringing it near a compass needle. If you find that any part of the watch repels the compass needle, you will know that magnetism still remains in the watch, and you will be obliged to repeat the operation just described. If, after treating it several times in this manner, you find that it still retains magnetism, you can remove the last trace by the judicious application of a permanent magnet to the edges of the watch.

(7) G. E. S.—The only successful way of burning petroleum under boiler is the jet burner, using the steam as a blow pipe. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 455, "Petroleum as Fuel;" No. 592, "Petroleum Burners;" No. 623, "Burners for Boilers;" No. 615, "Petroleum Fuel;" No. 618, "Lénoir's Petroleum Engine." There are several patents on devices for burning petroleum. You can turn a screw easier with a long screw driver because you have a better hold or grip. Salt liquefies ice by its chemical affinity for water, forming a liquid (salt water) that is fluid at a very low temperature.

(8) J. W. K., Jr.—Red shortness in iron is caused by excess of sulphur, amounting probably to four-tenths to six-tenths of 1 per cent. This causes the iron to be brittle at a red heat. Cold shortness or brittleness, when cold, is caused by phosphorus and silicon, the proportions varying from one to two tenths of 1 per cent. You will find description of crucible steel plant

in SCIENTIFIC AMERICAN SUPPLEMENT, No. 464, crucible, open hearth, and Bessemer in 505, open hearth illustrated in 615, Clapp-Griffith in 490, description of the steel plants in United States in 535, all of which we recommend for your perusal. To soften your brushes, put the shellac brush in 95 per cent alcohol, put the paint brush in turpentine to soak, or in strong solution of soda in water.

(9) N. N. W.—It is said silver prints will not curl at the edges if they are finally washed in the following solution:

- Water 1 part.
Alcohol 4 "
Glycerine 3 "

To ventilate a small dark-room, connect the dark room light by a good sized pipe to the outer air, or to a chimney having a free draught. Then provide openings in the partition at the bottom near the floor, protected by A-shaped wings, which will keep out the light, but let in air. The larger the openings in extent are, at the bottom, the better will be the circulation. The general principle to be borne in mind, is to let plenty of air in at the bottom, with an abundant free exit for the heated, bad air at the top, protected from light.

(10) G. S. A. asks: 1. How can I make a stain for walking sticks, different shades? A. See the formulas given for stains of all colors in "Moore's Universal Assistant and Complete Mechanic," which we can send you post paid for \$2.00. 2. A method for polishing alligator teeth. A. Rub them first with fine glass paper and then with a piece of wet linen cloth dipped in powdered pumice stone. This will give a fine surface, and the final polish may be produced by washed chalk or fine whiting, applied by a piece of cloth wetted in soapsuds. 3. A method for bleaching them perfectly white after they have turned yellow. A. Use peroxide of hydrogen. See article on its application, in SCIENTIFIC AMERICAN SUPPLEMENT, No. 339.

(11) J. H. F. asks how to make a toning bath for rich dark tones. A. If freshly sensitized paper is used, fume it for 25 minutes over ammonia. After printing, and prior to toning, wash the prints in three changes of warm water, letting the last water contain a minute portion of carbonate of soda. Pour into the toning tray the amount of gold you intend using, and neutralize it drop by drop with a saturated solution of carbonate of soda until it turns red litmus paper blue. Then add the amount of warm water necessary to complete the bath, and dissolve in the tray 100 grains of common salt. Let the bath stand for ten minutes. The longer you tone, the more purple will be the prints. They turn red at first, and then change to the desired color. If the bath is kept warm, the toning will proceed rapidly. Use an abundance of the gold solution.

(12) J. M. C. writes: While watching a pair of rough iron bevel wheels running, I saw sparks flying from the teeth. Supposing that they were caused by friction through not being properly lubricated, I examined them, found no sign of cutting or undue friction, and concluded that the sparks were from electricity, and not from heat. At the same time, in another place, one of our engines was so charged that it ran an electric bell with a single wire. A. We differ with you in regard to the cause of the sparks. The gears are metallic and are conductors of electricity. The conditions of metallic contact as with gearing do not admit of an atmospheric escape of electric sparks; they go the other way. The sparks, no doubt, are derived from the heat of friction developed in the minute particles of iron dust abraded from the surface of the teeth. The teeth of the gears would not show much increase in temperature, but any minute particles driven off by friction would take fire in the same manner as in the cold sawing of iron. The slipping of the driving wheels of locomotives strikes fire in the dust of abrasion. Your engine was charged with electricity from the belt, which is a very common phenomenon. By placing an insulated row of metallic points near the inside of the belt, a few feet from the large pulley, you may make a very interesting electric display by insulating a person on a rubber mat, or a platform set on glass bottles, and in that way, by taking hold of the end of the metallic receiver under the belt, make the person a Leyden jar, capable of giving quite a shock by touching another person or a number of persons holding each other's hands.

(13) D. E. W. asks: 1. Can iron which has been made into stove funnels, but which is nearly new, be used for the field magnet of the motor? A. It is better to use new, clean iron, but without doubt your iron will answer if well scraped and cleaned. 2. In a bichromate of potash battery, would the battery work as well if the zincs were amalgamated? A. The zincs must be amalgamated. 3. Is there any limit as to the numbers of messages which can be sent on the same line at the same instant? A. The practical limit is four.

(14) O. M. M.—There are tools sold by the dealers in emery wheels that break up the surface or true it, when glossy or out of true. Hydrochloric or nitric acid will clean a metalized wheel. Swab the surface with the acid, let it lie 15 to 20 seconds, and quickly wash the surface clean with water, and dry.

(15) F. M.—We have no knowledge of the welding compound you mention, nor have we any reliable receipts for welding cast iron to cast iron. Such work is impracticable. Steel, it is said (probably machinery steel), has been welded to cast iron by the use of borax and sal ammoniac. Cast iron that has been treated to make malleable iron can be welded to steel with borax. It is also said that two pieces of cast iron may be sweated together with borax. This process is liable to melt one or both pieces.

(16) F. B. M. asks what to use to prevent brass from tarnishing after it has been polished, as in the brass standards and lecterns of a church; the manufacturers of them put something on that kept them from becoming dull for a long while. A. Use a solution of clear shellac in 95 per cent alcohol. A half ounce shellac to one pint alcohol, cork tight in a clear bottle. Shake and set it in a warm place for a few days. Decant the clear solution at the top for your lacquer. Use a camel's hair flat brush. Heat the brass work to nearly

the temperature of boiling water, in an oven or otherwise, and varnish quickly, going only once over the work; put the work back in the oven for a few minutes to melt and make the lacquer clear.

(17) J. M. W. asks what kind of paint is the best, most durable, and smoothest to use on the bottom of small sail boats, yachts, on fresh water lakes. Used black paint composed of lamp black and linseed oil, last year, and bottom became very rough and coated with a vegetable growth. A. Use a little plumbago (pulverized) in the black paint, when dry, rub down smooth with dry plumbago on a woolen rag. Repeat the rubbing at times during the season, and if the paint gets worn off or thin, rub with plumbago and linseed oil. A little coach varnish mixed with any painter's color makes a good finish for upper work.

(18) H. N. L. asks: Will a balance wheel which is out of balance shake or tremble, if run on an upright shaft? And if so, why? A. Yes; it will shake, and if run fast enough it will shake the building. The centrifugal force of the heavy side will exert its full value upon its confining center or shaft, which will spring, and if in unison with the surrounding framework holding the journals, may set a whole building to vibrating.

(19) S. E. M. asks: What are the wages paid to good draughtsmen, and what is the best way to learn draughting? A. There is no regulated scale of wages of a draughtsman. A boy can drive a rule and pen, but it takes brains to make a good draughtsman. This commodity may be worth from \$500 to \$5,000 per annum. If you have ideas and have the energy, you will succeed accordingly. To start, get the series of SCIENTIFIC AMERICAN SUPPLEMENT, on mechanical drawing (\$2.50), with the instruments there listed, and get to work. After you have assured yourself that you can handle the pencil and pen, offer your services as assistant in some engineering establishment.

(20) T. H. asks a formula for the strength of threaded couplings on iron pipe, in supporting weight hung, as on a rope, safe load, also breaking or stripping weight. A. The ordinary make of couplings on iron pipe cannot be trusted for more than one-half the value of the area of pipe section, on the basis of 30,000 pounds per square inch, divided by 4 for safe load, or divide the area of section in square inches by 2, and multiply by 30,000 for breaking load. Divide the breaking load by 4 for safe load for short usage. If for a pump rod, divide by 6.

(21) W. B. asks: What will remove shellac and varnish from Spanish cedar without cracking or marring it? A. If it is a varnish in which turpentine was the solvent, use a mixture of alcohol and turpentine. If it is shellac varnish, it can be removed by a simple application of alcohol.

(22) P. H. asks: 1. How is royal copper, or sometimes called cypress copper, made, such as seen on lamp bodies, imported from France? A. For the red color on copper. Boil the articles in tartaric acid and water 15 minutes, rinse in cold water and dry. 2. Which is the best way to purify mercury for surgical purposes and for barometers? A. Mercury is purified by distillation, or by prolonged treatment with dilute nitric or sulphuric acids, followed by washing and heating over 212° F. Distillation is the best method.

(23) W. W. D. asks: 1. Can the small electric motor described in SCIENTIFIC AMERICAN, of March 17, 1888, be driven by a current generated by an earth battery? A. We think it would be impracticable, as it would require a large number of plates of large size. 2. What number of plates will be required, what the size of each plate and how should they be arranged in the ground so as to attain the greatest electro-motive force? A. We have no data which will enable us to estimate the number of plates required, but it would probably run up into the hundreds.

(24) E. M. writes: I have secondary coil of an induction coil 6 3/4 inches long, 2 1/4 inches in diameter, hole through center 1 1/4 inches in diameter, wound with 24 layers of No. 36 silk covered copper wire. What size of wire and how large core of primary coil for the above should be used to secure best results? A. The hole through the center of your coil is rather large—an inch, or 1 1/8 inches would have been ample. Make the core of your coil of a bundle of No. 20 soft iron wire. The primary coil should consist of 2 layers of No. 16 magnet wire.

(25) S. D. B. writes: 1. I wish to make motor one-half size of one you describe. Please inform me the size wire I must use, both iron for armature ring and insulated. A. Use No. 20 wire. 2. Will it be advisable to use it for watch makers' lathes, and is there power enough for Moseley's No. 2? A. It will readily run a watchmaker's lathe.

(26) J. P. M. asks how to cover a wooden wheel with emery so that it will stick. A. Use the best and strongest brown glue, well heated and quite thick. Warm the wood, and apply the glue hot with a brush, following behind the brush with a sprinkling pan of emery, or roll the wheel in the emery as fast as the glue is applied. When dry, the excess will readily come off by scraping.

(27) D. W. C. asks: What is the metal molybdenum used for? A. The principal use of molybdenum is for the manufacture of molybdate of ammonia, used in phosphoric acid determinations, and of similar salts.

TO INVENTORS.

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INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

May 1, 1888,

AND EACH BEARING THAT DATE.

[See note at end of list about copies of these patents.]

Table listing inventions with names and page numbers. Includes entries like Air brake, T. S. E. Dixon; Alumina from clay, obtaining, F. J. Seymour; Aluminum furnace for reducing, F. J. Seymour; Annunciator, pneumatic, W. R. Ostrander; Arrow for passing cord through pipe lines, J. Geyser; Axle for thrashing machines, F. W. Robinson; Axle lubricator, car, S. Vesot; Axleplate for wheeled scrapers, agricultural machines, and similar purposes, pole attaching, G. W. Taft; Axle, wagon, N. W. Blevens; Axle washer, N. Harris; Bales, machine for putting ties on, W. E. Dunbar; Baling press, P. K. Dederick; Baling press, W. A. Laidlaw; Baling press, H. R. Wolfe; Band cutter, J. L. Horst; Bar, See Grate bar; Basket, fruit, J. H. Marvil; Baskets, etc., apparatus for manufacturing, L. Stevens; Bath, See Needle bath; Batteries, automatic switch for secondary, J. S. Sellon; Battery, See Secondary battery; Battery plates, apparatus for preparing secondary, A. F. Madden; Bed bottom, W. L. Phillips; Bed pan, invalid's, G. W. Tooker; Bell, signal, G. W. Eddy; Bellows, F. Christen; Belt tightener, C. Pierce; Bird food holder, H. F. Estabrook; Bleaching, E. Hermite; Block signal, G. W. Peterson; Board, See Ironing board. Mould boards; Boiler, See Steam boiler; Bolt, See Flour bolt; Bolt cutter, W. L. Dutcher; Bolting reel, B. Kniffer; Bolting reel frame, W. E. Gorton; Book cover, E. V. Fohlin; Boot or shoe nail or rivet, G. A. Cavalli; Boot or shoe, ventilated, H. A. Stevens; Bottles, stopper, W. H. Redington; Bottling machine, beer, J. C. Bauer; Box, See Letter box. Musical box; Box or case, A. H. Storey; Brake, See Air brake. Car brake. Wagon brake; Bridle bit die and making bridle bits, J. Stanley; Brooder, poultry, G. S. Singer; Buckle, E. H. Wheeler; Buckle and spring hook, combined, W. James; Buckle shield, elastic, G. O. Simmons; Buckle, suspender, C. Voorhis; Buffing machine, T. E. Keavy; Bung fastener, Gemunden & Gartner; Bung making machine, F. M. La Boiteaux; Burial caskets, fastener for, E. & B. Holmes; Burner, See Gas burner; Bustle, L. Smith; Button, A. J. Shipley; Buttonhole cutting and embossing machine, French & Meyer; Cable grip, W. J. E. Carr; Cannon, pneumatic, W. A. Bartlett; Cant hook, C. Nygaard; Canteen, E. A. Trim; Car brake, E. E. Baker; Car brake, J. S. Sterrett; Car coupling, W. De Cew; Car door, T. G. Ruffhead; Car door, freight, C. Hager; Car, stock, Miller & Seltz; Car, street, J. W. Evans; Car switch, automatic, J. R. Potter; Cars, air brake for railway, T. S. E. Dixon; Cars, electric lighting apparatus for railway, H. E. Dey; Cars, sand box for street, W. V. H. Willson; Carpet fabric, H. Hardwick; Carriage boot, J. W. Storrs; Carriage curtain fixture, F. A. Brandenburg; Carriage top, J. Mortz; Carriage top, folding, J. Mortz; Carrier, See Egg carrier. Trace carrier; Case, See Printer's rule case. Show case. Watch case; Casting saw teeth, mould for, H. G. Hubert; Ceiling, metallic, W. R. Kinnear; Cervix clamp, W. S. How; Chain, drawing, C. C. Klinik et al.; Chain, drive, E. Sobenck; Chair, See Tilting chair; Chuck, lathe, F. H. Van Houten; Churn, L. H. James; Cigar boxes, temporary partition for, N. Du Brul; Cigar bunching machine, Logan & Canley; Clamp, See Cervix clamp; Clasp, See Ticket clasp; Clasp, J. H. Conaty; Clipping machine, hair, L. S. Lee; Clothes drier, H. C. Price; Clutch, friction, W. R. Havens (r); Coat and hat hook, W. H. Lawson; Coffee making machine, E. K. Sargeant; Coffin, J. H. Chamberlaine; Colter, rolling, D. A. Moon; Combination lock, J. Bergman; Conveying apparatus, H. U. Palmer; Cooker, steam, Smith & Barker; Copies, apparatus for setting writing, J. Curzon; Copper, purification and alloying of, F. J. Seymour; Corkscrew, McCarthy & Thenis; Corn shucking and shelling machine, L. R. Whitling; Corn splitting and cutting machine, C. J. Porter; Coupling, See Car coupling. Pipe coupling. Thill coupling; Crank and lever motion, W. A. Pitt; Crucible, J. E. Holmes; Cultivator, H. L. McCoy; Cultivator, J. F. Packer; Cultivator, cotton, Irwin & Hairsrove; Cultivator, wheel, W. L. Cassaday; Cut-off for spouts, F. Driller; Cutter, See Band cutter. Bolt cutter.

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