soda crystals with milk of lime, produced by slacking ing much oxide of iron. No. 2 is a piece of red jasper. 1/2 lb. of quicklime with hot water well stirred: then rinse them in a fresh caustic soda or potash solution and transfer immediately to the silver bath.

(33) V. & G. say: 1. We cut off steam at 8 inches on one end and 10 inches on the other end of our 14x28 inches cylinder. Is this right? We find that if we make it cut off alike on both ends that the valve opens wider on one part than the other. A. It is impossible in a common slide valve to make the points of admission cut off and release equal for each stroke; and it is preferred to keep the points of admission equal. 2. There is about 34 of an inch space between the cylinder head and the fellower. Would we save any steam to make our cylinder head thicker and reduce this space? And if so, how much space should there be? A. Yes. About 16 inch. 3. Is a variable cut-off valve, working on the back of the main valve, better than to vary the of the eccentric rod on an arm? A. It is considered so.

is an ohm, and why is it so called? A. The ohm is the unit of resistance in electrical measurements. It is equal to the resistance of a prism of pure mercury, one square millimeter in section, and 1.0486 meters long, at 0°C. The name ohm was given the unit in honor of Dr. Ohm, a celebrated physicist. 2. In chemistry, which of the two metals, zinc and lead, has the greater affinity for silver? A. Zinc.

of waterproof pants, in which to work in water from 6 to 10 hours at a time, without getting wet through. Will twilled cotton, thoroughly coated with raw oil, answer the purpose? Or is there any better coating? Λ . part beeswax, thinned down so as to readily penetrate the cloth. A better way is to use a thin varnish made by dissolving india rubber in bisulphide of carbon containing about five or six per cent of absolute alcohol. A very thin coat of the varnish will answer, and is

(36) J. K. T. asks: Is there any way to shrink boots, which have been stretched while wet, into shape again? A. We do not know of any.

How can I polish a gun stock? A. Put on several good coats of shellac, rubbing each one down when dry with pumicestone, and finish with a fine linen wad kept constantly moistened with thinalcoholic shellac and occasionally a drop of oil.

(37) B. L. H. asks: Will you please inform me of the process of marbleizing iron? A. See article on enameling iron ware, p. 21, vol. 36. The variegated colors may be produced by the addition of oxide of antimony, manganese, and iron to the glazing, before the final fusion. This also answers W. M.

(38) A. R. S. asks: How can I get the impression of an article in plaster of Paris without the article becoming set in the plaster? A. If there are any inward curves or angles in the model you cannot make a correct cast of it at once. For intricate work the model must be in several parts, from each of which a separate cast is taken; and then all of them properly joined to form one mould. This subject has been dealt with in detail by Mr. Joshua Rose in late numbers of the Sci-ENTIFIC AMERICAN. Where the undercut curves or angles are not very sharp, it is sometimes possible to get a cast in glue, which, being more elastic than plaster, admits of a certain amount of compression and stretching in removing the pattern. The water in which the glueis dissolved is mixed with enough glycerin to retain the glue as a stiff jelly on cooling. The patterns are carefully oiled before being brought into contact with the glue. From the first cast a second one, in glue, may be taken, and from this, in turn, a plaster cast, thus copying the first.

(39) T. W. asks: What is the best non-conducting material (for heat) whether of animal, vegetable, or mineral nature? A. Among substances of animal origin, feathers, wool, hair. silk, etc., are the best. Among vegetable substances, charcoal, sawdust, shavings, cotton, and dry fibers in general. All these, when dry, are excellent non-conductors. Of mineral substances, asbestos, mineral wool, porous tiles, and clay bricks, also slabs or bricks of porous infusorial earth, etc.

(40) N. M. W. asks: How can I clarify and polish horn? A. It is usually first scraped, and then rubbed down with emery powder and water, and finished with tripoli or rouge. In working horn, the bony core should first be removed by soaking in cold water for several weeks, which treatment loosens the core, so that it may be pulled out. Boiling water temporarily softens horn: and while soft it may be slit, and spread out by pressure between hot iron plates.

see a statement of the effect of sulpho-carbonate of po- | please state the number and date of the patent desired, tassium on the eggs of the potato bug. Would the apand remit to Munn & Co., 37 Park Row, New York city. plication of this chemical to the field be likely to poison the potatoes, so as to make their use dangerous? A. No; but it may impart an unpleasant smell to some of the tubers, if used excessively.

(42) Z. H. asks. 1. Can grain nickel be melted in an ordinary furnace used for melting brass? A. If the furnace is provided with a very good draught, you may succeed in fusing small quantities of it at a time. It requires a very high temperature, and a long exposure in the furnace to get it liquid enough to run. 2. Will it run without an alloy? A. Yes.

(43) A. L. S., Queensland,—Remit 16 shillings sterling for Scientific American one year, which includes postage.

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

J. M. B.-A. is properly an agate, of little value. B. arc pebbles of milky quartz and flint.-W. J.-It is a clay containing a considerable amount of infusorial silica. It is an excellent article for polishing purposes, and, if properly washed, might prove marketable.-J. H. C.-No. 1 is an indurated clay, contain-

No. 3 is a felspathic rock, containing small specks of $iron\,pyrites\,and\,\,chal copyrite\,(sulphide\,\,of\,\,copper).\quad {\bf No}.$ 4 is nodular pyrites (marcasite). See p 7, vol. 36. None of the specimens are valuable.-H. W. S.-It is mostly magnetic pyrites (pyrrhotine).-M. S.-No. 1. The coating contains manganese and very Drobably Zinc. No. 2 is an earthy oxide of cobalt-a variety of No. 1. No. 3 is gneiss rock with sulphide of iron. No. 4 is magnetite. -F. H. P.—A is a piece of hornblende. B is gneiss rock, with a few iron garnets. The crystal is calcitecarbonate of lime. -M. W. R .- It is mica schist (a silicate of potash, alumina, magnesia, and iron) with chlorite (a hydrous silicate of magnesia, iron, and alumina). -K. H. R.-They are pebbles of flint, common agate, chalcedony, and quartz. We do not consider them valuable. Such pebbles can be found on most sea shores. It is impossible for us to say where the pebbles came from, or where similar ones could be found in quanticut-off of the main valve by raising or lowering oneend ties. We have seen magnificent agates from the Pacific coast, and we understand that they abound near San (34) L. H. R. asks: 1. In electricity, what Diego, Cal. - E. E. - It is not coal, but cray containing a large amount of carbon.—C: A. M.-It is a wax, called by dealers Carnauba wax.

M. B. & R., of Melbourne, Australia, say: The greatest enemy that the fruit gardener has to contend with in this colony is the sparrow, and it seems a matter of great wonder that no means have yet been introduced to stop its ravages. Those who have not had ocular demonstration would scarcely eredit that these (35) A. H. R. says: I wish to make a pair little creatur s could commit such havoc. Settling in flocks upon the choicest fruit trees, they will quickly completely denude them of every particle of ripe fruit. Here is an opportunity for the ingenious American to distinguish himself by inventing some contrivance to No. Try a mixture of about 10 parts boiled oil and 1 | preserve the trees from their ravages. Of course the invention must also have the merit of cheapness, so as to bring it within the reach of all classes.

COMMUNICATIONS RECEIVED.

The Editor of the Scientific American acknowledges, with much pleasure, the receipt of original papers and contributions upon the following subjects:

On Painting Axes. By W. E. W. On the Dunkirk Microscopical Society. By C. P. A., and by J. E. S.

On the American Cicada. By H. H. On a Discovery in Geometry. By L. S. B,

On Torpedoes. By J. P. W. On Converting Motion. By F. S.

On a Decimal System of Computing Time. By C. E. D. On Capital and Labor. By-

On Boiler-Covering Composition. By P. C. On Liquors. By C. F. F.

On Water Evaporated through Engines. By W. A. M. Also inquiries and answers from the following: C. M. K.—S. B. E.—A.—J. B. B.—A. S.—J. M. W.— A. S. T.—J. E. B.—B. K. A.—W. O. W.—J. C. II.

HINTS TO CORRESPONDENTS.

Correspondents whose inquiries fail to appear should epeat 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

Hundreds of inquiries analogous to the following are sent: "Who makes machines for breaking down rice straw for paper-making? Who sells steam heaters, in which the heat may be readily varied to suit the wants of the household? Who sells electric candles, as described on p. 339, vol. 36? Who sells decorative tiles? Who sells hydraulic lime?" 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

May 15, 1877, AND EACH BEARING THAT DATE.

[Those marked (r) are reissued patents.]

A complete copy of any patent in the annexed list, I including both the specifications and drawings, will be (41) A. L. B. says: In one of your papers I_i furnished from this office for one dollar. In ordering,

	Awl haft, N. B. Dit Lepine	190,747	In
	Bag fastener, A. B. Cate	190,666	In
	Bag machine, Arnold & Quigley	190,663	Ire
	Baling press, J. E. Hanger		Ja
ļ	Bark mill, W. F. Mosser	190,777	Κı
i	Barrel trussing machine, W. Bayley	190,731	Κı
	Basin, J. H. Keyser		$\mathbf{L}a$
	Bed bottom, G. Eade		\mathbf{L}_{0}
	Bee hive, G. Kraetzer		La
ı	Bee hive, N. Zimmerman	190,947	L_8
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ı	Binder, hand, J. O. Brown	190,702	Le
ı	Bird cage support, F. W. Long	190,881	Li
ı	Blackboard eraser, H. L. Andrews	190,662	Li
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ı	Blind slat adjuster, H. Gaylord	190,847	L
ı	Blowing machine, Cochrane & Hendy	190,828	\mathbf{L}_{0}
ı	Blowing machine, J. W. Wilbraham	190,943	Lo
ı	Bone black revivifier, J. Gandolfo	190,676	L
I	Books, binding, W. Gillilard		Lo
	Boot and shoe, T. J. Greenwood	190,753	Ĺι
ı	Boots, crimping, L. O. Makepeace (r)	7,686	Lı
ı	Boot uppers, crimping, I. H. & J. D. Spake	190,922	M
ı	Bootjack blanks, forming, H. A. Brown	190,735	M
ı	Bottle, composition seal, C. M. Jacob	190,865	M
ı	Breech loading firearm, H. W. Chapman	190,820	M
	Bridge truss, J. H. Snyder	190,921	M

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of O.	Broom, A. Stephen Brush, R. W. Champion	190,821	Neck tie retainer, L. Hussey
e	Brush handles, making, J. L. Whiting		Nut lock, Brown & Hucy
y t-	Bung and bush, combined, E. Rodier Butter worker, Cornish & Curtis	190,905	Ore washer, D. Beaumont
2	Butter worker, G Ridler	190,692	Organ case, L. K. Fuller
3 e.	Cane and pipe, Hirsch & Ettinger		Organs, etc., coupler for, R. E. Letton
8	Car coupling, P. Hien		Pantograph, E. Ware
i-	Car coupling, G. M. Thompson	190,931	Paper box, H. L. R. & O. Wolf
)- \	Car pusher, J. E. Gearhart	190,853	Pen, fountain, H. N. Hamilton
اد کو	Car starter, L. Russell		Pillow ventilating, J. T. Hatfield
l-	Casing spear, F. J. Fox (r)	7,675	Pitman, H. L. Hopkins
e .	Casting, composition for, A. Kiesele		Pitman connection, J. W Blood
i-	Chair back and seat, H. C. Knowlton		Plow. H. Opp. Plow, S. G. Reynolds
c n	Chair, nursery, J. C. Wheeler	190,820	Plow, W. M. Towers
ı- İ	Chair, reclining, H. S. Smith		Plow jointer, J. Densmore Plow, reversible, J. Gogel
,	Churn, D. C. Chadwick		Plows, stubble guard for, B. F. Phillips
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-	Cider press, S. M. Ellis		Pocket, safety, F. Wendt
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0	Corn planter, etc., L. E. Williams		Railway rail joint, Il botson & Talbot
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0.	Cotton chopper, etc., E. C. L. Bridges		Refrigerator, S. Gasper
	Cultivator, J. R. Tilley		Rock drill, R. Allison
:	Darning last, M. B. Crowninshield	190,745	Roofing, fireproof, A. C. de la Martelliere
į	Dental chair, J. B. Morrison (r) Desk, school, J. Peard		Roylock, W. Spelman
	Desks, folding seat for school, O. Davis		Sash fastener, C. E. Hicks
,	Disks for stamper shanks, J. Cliff	190,668	Saw mill, muley, T. E. Chandler
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•	Fence wire, barbed, J. Dobbs		Sewing thimble, N. T. & T. Porter
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i	Fireman's belt, F. Costantino		Shoe nail, Cushman & Brigham. Shot bug and charger, T. J. Jolly
i	Fruit crate, J. H. Marvil. Fruit drier, J. R. Dodge, Jr		Sign letter, metallic, C. Temme. Skylight, J. Henry
ì	Fruit drier, Kelly & Cole	190,685	Sled, bob, J. Littfin
c	Fuel, artificial, W. C. A. Roettgerr Furnace blower, etc., L. C. Cook		Slop hopper, J. Marquis (r) Sludge oil, etc., treating, W. P. Jenney
1	Fuse, percussion, B. B. Hotchkiss		Smoke, consuming, J. C. Baum (r). Soap boiler, J. M. Jackman
7	Gage, carpenter's, G. W. Vaughan	190,934	Soldering machine, H. Mitler
, ,	Gage, pressure, W. T. Snyder		Spinning frame ring, W. F. Draper
f	Gang edger, Evans & Snyder		Spittoon, P. C. St. Marie
3	Gas burners, liquid, H. W. Dopp	190,673	Steam cylinder, relief, J M. Hartman
,	Gas carbureter, C. A. Enggren		Steam engine, L. H. Hall
1	Gas holder, W. & R. H. Smith		Steam engine, rotary, Scudder & Wager
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3	Gate, farm, H. N. Dunbar	190,916	Stove extinguisher, car, Pegram & Hotchkiss
?	Gearing, screw, H. Hackman, Jr		Stove leg, P. Hauersperger. Stove mat, Reimers & Branch
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t +	Grain separator. L. V. Davis		Stoves, casing for ear, H. Tanner
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í	Harrow F. M. Davison	190,833	Tailor'smeasure, G. H. Lasar
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,	Hinges, making, L. B. Gusman Hoe, J. S. Lester	190,878	Toy money box, W. Bruce
i	Hoisting and conveying, F. A. Clarkson		Toy wagon, H. Thomass
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1	Hop extract, composition, J. R. Whiting	190,801	Valve, safety, N. Du Brul Valve, safety, Maurel & Truel
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, '	Horse hay rake, D. W. Travis	190,696	Vent apparatus, Schott & Heberling
3	Horse hay rake, H. C. Velie	190,740	Vermin trap, J. M. Berger Wagon end board, T. Stevens
•	Horseshoe bar, A. Barton		Washing machine, Baldwin & Parkhurst Washing machine, W. Johnson
	Hot air furnace, W. McFarland	190,773	Washing machine, M. W. Robinson Wasteway plug, Keyser & Turton
7	Hydraulic motor, J. M. Bois		Water closet, effluvia ejcetor, W. Smith
6	Insect destroyer, C. H. Emerson	190,839	Water elevator, Gamble & Wagner
2 '	Jar eover, closing, T. A. Weber	190,940	Water regulator, L A. Seowden
7 1 ,	Knitting machine, J. M. Slack	190,855	Water urn, E. A. Parker
6 ! 9	Lamp, L. H. Olmstead	190,894	Whiftletree hook, N. Y. Shaw
1	Lamp chimney, J. McMurtry	190,886	Windmill, W. A. Williams Wire rope, splieing, H. Channon
0	Lamp chimney, shade, etc., G. W. Martin Lamp, safety collar, J. H. Lewars	190,879	Woven fabrics, finishing, J. Short
1	Latch, closet, W E Sparks	190,792	DESIGNS DAMENTED
1	Lifting jack, I. D. Johnson	190,718	DESIGNS PATENTED, 9,971.—Shade Rings.—L. J. Atwood, Waterbury,
7	Liquid diffuser, G. M. Smyth Liquids, conveyance of, G. W. Remsen	190,902	9,972 —CASSIMERES.—G. C Burns, Burrillville, R. I
	Lock for satchels, etc., W. Roemer		9,973, 9,974.—HANDLE EARS.—R. H. Burr, West Me Conn.
3 ′	Loom temple, C. II. Schlaf. Lounge, folding, H. S. Carter (r)	190,783	9,975 to 9,987.—WALL PAPER.—C. Dresser, London, 9,988.—OVERSHOES —A S. Hubbard, New Haven,
7	Lozenge machine, C. H. Hall	190,754	9,989.—LAMP BRACKUTS.—A. D. Judd. New H
	Lubricator for steam engines, W. Moses Lubricator for journals, J. H. Burnett	190,665	Conn. 9,990.—Cassimeres.—C. Kimball, Mohegan, R. I.
2 5	Malt extract, separating, H. R. Randall	190,899	9,991.—GLASS JAR.—S. R. Pinckney, New York cit
5	Marking ground, F. W. Byrne	190,819	A copy of any one of the above patents may be h
0	metallurgic nearth, removable, A. Ponsard	150,031	remitting one dollar to MUNN & Co., 37 Park Row,

	Neck tie retainer, L. Hussey Nut lock, Brown & Huey	. 190,8
	Nut lock, Blown & Huey	190,73 190,8
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5	Paint, W. P. Jenney	190,6 190,7
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ì	Plows, sulky attachment for, W. K. Bushnell	190,73
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į	Pump bucket, chain, E. Miller	190,88
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į	Punch for leather, etc., C & A. B. Jenkins Punching metal, etc., A. Lee	190,68
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ı	Rock drill, R. Allison	190,69
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	Sled, bob, J. Littfln	190,88
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Conn. 0,975 to 9,987.—WALL PAPER.—C. Dresser, London, Eng. .988. -Overshoes -A S. Hubbard, New Haven, Conn. ,989.-LAMP BRACKUTS.-A. D. Judd. New Haven,

21 'Moulding and casting pipe, J. K. Dimmick...... 190,835 'York city.]