Business and Personal.

The charge for Insertion under this head is One Dollar a line for each insertion; about eight words to a line. Adver-tisements must be received at publication office as early as Thursday morning to appear in the following week's issue

Complete Machine Shop out fits furnished. Send for prices and list of new and second hand Machinery. W. P. Davis, Rochester, N. Y.

"U.S." metal polish. Indianapolis. Samples free. Presses & Dies. Ferracute Mach. Co., Bridgeton, N. J. 6 Spindle Turret Drill Presses. A.D. Quint, Hartford, Ct Best baling presses. Ryther Mfg. Co., Watertown, N.Y. G. D. Hiscox, 361 Broadway, N.Y., Consulting Engineer Portable and Stationary Cylinder Boring machines. Pedrick & Ayer, Philadelphia, Pa.

For Sale-Gas engine launches, nearly new, S. N. Stewart, Rock Island, Ill.

Tools for sheet metal goods, presses, lathes, dies, etc Empire Machine and Tool Co., New Brunswick, N. J.

Prof. Rogers used Jesson's steel for meter standard. erican Machinist, October 13, page 1, column 3. The Improved Hydraulic Jacks, Punches, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York. Stow flexible shaft. Invented and manufactured by

Stow Mfg. Co., Binghamton, N. Y. See adv., page 254.

Screwmachines, milling machines, and drill presses The Garvin Mach. Co., Laight and Canal Sts., New York Centrifugal Pumps. Capacity, 100 to 40,000 gals. per minute. Allsizesin stock. Irvin Van Wie, Syracuse, N.Y. Portable engines and boilers. Yacht engines and B. W. Payne & Sons, Elmira, N. Y., and 41 Dey

Guild & Garrison, Brooklyn, N. Y., manufacture steam pumps, vacuum pumps, vacuum apparatus, air pumps, acid blowers, filter press pumps, etc.

Street, New York.

For stone quarry engines. J. S. Mundy, Newark, N. J. Split Pulleys at Low prices, and of same strength and appearance as Whole Pulleys. Yocom & Son's Shafting Works, Drinker St., Philadelphia, Pa.

Perforated Metals of all kinds and for all purpo general or special. Address, stating requirements, The Harrington & King Perforating Co., Chicago,

To Let-A suite of desirable offices, adjacent to the Scientific American offices, to let at moderate terms. Apply to Munn & Co., 361 Broadway, New York.

Fine castings in brass, bronze, composition (gun metal), German silver. Unequaled facilities. Jas. J. McKenna & Bro., 424 and 426 East 23d St., New York.

The best book for electricians and beginners in electricity is "Experimental Science," by Geo. M. Hopkins. By mail, \$4; Munn & Co., publishers, 361 Broadway, N. Y. Canning machinery out fits complete, oil burners for soldering, air pumps, can wipers, can testers, labeling machines. Presses and dies. Burt Mfg. Co., Rochester

Competent persons who desire agencies for a new popular book, of readysale, with handsome profit, may apply to Munn & Co., Scientific American office, 361 Broadway, New York.

Send for new and complete catalogue of Scientific and other Books for sale by Munn & Co., 361 Broadway, New York. Free on application.



HIN'TS TO CORRESPONDENTS.

Names and Address must accompany all letters, or no attention will be paid thereto. This is for our 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 rejeated; 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.

or in this department, each must take his turn.

Special Written Information on matters of personal rather than general interest cannot be expected without remuneration.

Scientific American Supplements referred to may be had at the office. Price 10 cents each.

Books referred to promptly supplied on receipt of

Minerals sent for examination should be distinctly marked or labeled.

(4569) Mechanic asks: What is the most approved motor or engine that is run by com pressed air ? A. Any motor or engine that is suitable for steam is equally good for compressed air. The economy of expansion applies to both air and steam

(4570) L. J. W. asks how to construct a simple metal thermostat or regulator for a home-made incubator. A. It is not a simple matter to make a thermostat. However, you can make a thermostatic bar that might answer your purpose by pressing or riveting together steel and brass strips, each about 1-16 inch and 15 i forms of thermostat consult "Experimental Science" and SUPPLEMENT, Nos. 420, 848.

(4571) A. B. asks: What is the proper place for a blower-under the grates of boiler or in the smoke stack? A. When the smoke stack has ample capacity but is weak in draught from low height, a blower connected under the grate is the most economi cal and satisfactory. A steam jet in the stack is much used, but is wasteful of steam for the work it does, as applied in the ordinary way with an open jet. The Korting multiple pozzle jet blower is a most economical and efficient device in either place, as most conve-

(4572) J. P. G. asks what size wire to use in winding the fields and armature of the dynamo described in Supplement No. 161, and with what size wire would you make the connections? A. For the leads on your dynamo use No. 16 wire. The proper sizes of wire for the winding are given in the article referred to. They are respectively No. 16 and No. 18, Am.

(4573) A. B. C. asks: 1. Has the strength of a tlash of lightning (in volts) ever been calculated? If so, what is it? A. The E. M. F. of a bolt of light-

ning has been estimated to be 3,500,000 volts and the current to be about 14,000,000 amperes. 2. How can I color glass for a ruby light for photographic purposes A. Coat your glass with red lacquer. It would be well to put red lacquer upon one side and orange lacquer on the opposite side. 3. In making a dynamo should the wire of the armature be insulated from the core? A. Yes. 4. Would the field magnet be better if made of cast iron or steel? A. The core of a field magnet should be made of the softest wrought iron. 5. How can I find the resistance of an incandescent lamp? A. By any of the methods of measuring resistances. You can use a rheostat, battery and galvanometer and measure it by means of the methods of substitution, or you can measure it by using a Wheatstone bridge. 6. How is the loop of bamboo in incandescent lamp carbonized? A. By inclosing it in a form buried in powdered carbonand subjected to a red heat for an hour or so. 7. Is there any good way to renew the carbon in incandescent lamps? If so, how? A. We know of no simple way to accomplish this. The following is extracted from "L'Année Electrique:" To mend a ruptured filament. Open the bulb at the top, break off the pieces of the old filament, put in some liquid hydrocarbon (naphtha), insert new filament, start voltaic arc between one of its ends and one of the terminals. This solders it with a deposit of carbon, Repeat for other end and terminal. Empty out hydrocarbon, exhaust, and

(4574) E. P. asks how the paste of litharge and red lead are mixed for a storage battery. A. The litharge and red lead are mixed with dilute sulphuric acid; acid 1 part, water 9 parts,

(4575) B. W. S. says: Is it not true that an air fan or blower will handle more air if the blades of the fans are thin than if they are thick, and if so, why? A. It makes little or no difference with thick or thin blades when the blower is working against pressure, as with forge fires, but makes considerable difference when used for ventilations only with no pressure. In this case there should be as little obstruction as possible in the air way. Such a fan should have the greatest area possible with the least air friction surface for economy or efficiency.

(4576) C. F. W. asks how to make "serpent's eggs." A. The black liquor which results as a useless product when coal oil is purified with sulphuric acid is to be treated with fuming nitric acid. The dark colored resinous matter which swims on the surface is then collected, washed and dried, when it forms a yellowish brown mass having about the consistency of sulphur which has been melted and poured into water. When this mass is ignited it undergoes such a wonderful increase in bulk that a cylinder 1 inch long will give a snake about 4 feet in length.

(4577) Admirer says: We are contemplating putting in water works for our city. We wish to know if we put a reservoir at the source of our water supply, which is 12 miles from the town and 1,500 feet fall, will the pressure be too great and will the resist ance of common cast pipe sufficient to hold the water without bursting, and what size pipe would be necessary for a town of 2,000 people? A. The questions you ask are too important to be answered in a casual way. Your need the advice of a competent engineer, with a knowledge of the grades, to properly lay out the work. The pressure will be too great for cast iron pipe and for the plumbing. Wrought iron pipe is strong enough with a differential pressure valve, but a reservoir at a proper height near the town is preferable, with a free flow from the source. You will probably need an 8 inch pipe for the upper section and 6 inch wrought iron pipe the balance of the distance.

TO INVENTORS.

An experience of forty years, and the preparation of more than one hundred thousand applications for patents at home and abroad, enable us to understand the laws and practice on both continents, and to possess unequaled facilities for procuring patents everywhere. A synopsis of the patent laws of the United States and all foreign countries may be had on application, and persons contemplating the securing of patents, either at home or abroad, are invited to write to this office for prices which are low, in accordance with the times and our extensive facilities for conducting the business. Address MUNN & CO., office SCIENTIFIC AMERICAN, 351 Broadway, New York.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

October 11, 1892.

AND EACH BEARING THAT DATE

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

Advertising hoard, P. E. Green	48419
Advertising device, P. Herrmann	484 31
Air brake coupling I F Marble	484 03
Air brake coupling, J. E. Marble	202,009
alarm. See Burgiar alarm. Burgiar and hre	
	40.4.00
Alloy, anti-friction, T. D. Bottome	484,084
Auger handle, G. E. Rogers	484,050
Automatic sprinkler, J. Kane	484,321
Axlehox, car, E. L. Sharpneck	484,054
Axle lubricator, H. V. Conway	484,088
Axle lubricator, H. V. Conway Axle lubricator, C. C. Pierce Bag holder, A. Young Bahana case, J. T. Cornforth	484,234
Bag holder, A. Young	484.079
Banana case, J. T. Cornforth	484,35
Banjo, D. T. Moore	484,225
Bank, E. M. Goldsmith	484.310
Barrel heater, Weigel and Waechtler	484.073
Basic lined furnace, J. H. Darby	484.181
Battery. See Galvanic battery. Storage bat-	201,101
tery. See Galvanic Dattery, Storage Dat-	
Battery compound, W. Wright	484 385
Bean picker, H. A. Bacon	
Bee smoker, G. W. Brodbeck	484 17
Beer apparatus, J. H. Kersenbrock	484 096
Beer bottling apparatus, J. H. Kersenbrock	494 09
Bench. See Wash bench.	202,000
Beverages, charging portable fountains with car-	
bonated. J. F. Wittemann	484.07
Binder for leaves, G. H. Winslow	484,27
Binding device for periodicals, newspapers, etc.,	
O. F. Westrup	484,26
Bit. See Bridle bit.	
Blacking machine, coin-operated boot or shoe, N.	
B. Knight	484,32
B. Knight. Blast furnace, M. W. Iles.	484,02
Block: See Chain block	
Board. See Advertising board. Game board.	
Board. See Advertising board. Game board. Boiler, J. H. Waterman	484 350
Boiler furnace, steam, M. E. Herbert	484 15
Bookbinding, D. Waide	484 24
Dook or musical or fholder A O Drown	404.00
Book or music leaf holder, A. O. Brown	404 00
Bottle stopper, protective, J. Lihrowicz	404,33

	60		_
	Box See Stamp and match box. Box fastener, C. C. Martin. Box machine, Murry & Stutsman. Brace. See Ratchet drill brace. Brake. See Wagon brake. Brick in klins, setting, F. Alsip. Brick machine, G. Isaacs. Bridge gate, C. Stocker, Jr. Bridge, portable, J. T. Cassidy. Bridge by Miller. Bridge for Miller. Bridge & E. Adams. Brush, E. I. Miller. Buckle, G. E. Adams. Buckle, suspender, R. M. Wilson. Bugny spring equalizer, C. Glatiy. Bulddings, construction of, B. Russell. Burglar alarm, portable, D. D. Nolley. Nolley.	484,373 484,041	Inje Ink Ins
	Brace. See Ratchet drill brace. Brake. See Wagon brake. Brick in kilns, setting, F. Alsip	484,170	Inst Jar Jew Join
	Bridge gate, C. Stocker, Jr. Bridge, portable, J. T. Cassidy. Bridle bit, A. F. Ruhlow.	484,122 484,08 6 484,342	Join Join Jou
	Brush, E. I. Miller. Buckle, G. E. Adams. Buckle, suspender, R. M. Wilson.	484,279 484,274 484,274 484,309	Ket Kili Lar Lar
	Buildings, construction of, B. Russell	484,244 484,232	Lar Lar Lar
	Nolley. Burner. See Vapor burner. Butner cutter, J. A. Kaiser. Button, cuff, L. F. Brooks. Buttons, attaching, J. Mathison. Cabinet, J. Stein. Cabinet for displaying sample goods, A. T. Selden.	484,233 484,023 484,291	Lat Lat
	Buttons, attaching, J. Mathison	484,105 484,121	Lav Les Les
١	Smith	484,346	Les Lif Lig
l	Cameras, finder attachment for, W. B. Cogswell Cane and stool, combined, R. T. More Cannon, telescopic sight for, V. Berberich	484,179 484,334 484,285 484 125	Lig Log
	Car, dumping, M. W. lies. Car, railway, C. J. Seymour. Car seat, C. H. Matthiessen	484,019 484,119 484,215	Loc Loc Lul
	Cable splice, electric, F. A. C. Perrine. Cameras, finder attachment for, W. B. Cogswell. Cane and stool, combined, R. T. More. Cannon, telescopic sight for, V. Berberich. Car coupling, C. A. Tower. Car, dumping, M. W. Iles. Car, railway, C. J. Seymour. Car seat, C. H. Ma thiessen. Cars, apparatus for indicating the positions of railway, Hunter & Lucock. Cars or similar vehicles, system of and apparatus for heating railway, J. A. Shinn. Carbon filaments, manufacture of, T. A. Edison, 484,184,	484,205 484 343	Lul Ma Ma Ma
١	Carbon filaments, manufacture of, T. A. Edison, 484,184, Carving machine, Layer & Taylor	484,185 484,102	Me
	Carving machine, Layer & Taylor. Case. See Banana case. Packing case. Cash carrier apparatus, J. Schiemer. Cash register, E. F. Roberts. Cash register and indicator, T. Carney. Cash register, indicator, and recorder, T. Carney. Caster wheel, A. B. Diss	484,248 484,376 484,296	Me Me Mo
I	Cash register, indicator, and recorder, T. Carney. Caster wheel, A. B. Diss	484,297 484,305	Mo Mu Nic
	F. G. Stone. Chain block, J. R. Morgan. Chair. See Folding chair. Pneumatic chair. Channeling machine. H. H. Arnold.	484,124 484,038 484,130	Nu Nu Opt Ord
İ	Chart and blackboard, combined, J. B. & M. C.	484,363	Pac
	Powell Christmas tree light, H. W. Diek Chuck, drill, H. C. Sergeant Cigar bunch machine, F. C. Miller. Cinder conductor. H. C. Sargent Clamp. See Joiner's clamp.	484,118 484,219 484,164	Pa Pa Pa Pa
			Pat
	Cleaner. See wen of clearer deaner. Clor. See Ham clift. Clock, alarm, W. E. Porter. Clocke See Dry closet. Clothes deep of the Rist edt. Clothes line roop and clothes hanger, combined,	484,340	Per Ph
	Clutch, J. Fitzgerald. Clutch, W. H. McConnell.	484,308 484,224	Pic Pic Pla
	Collar, cuff, and garment rack, H. Caspar Colter, plow, G. C. Westervelt Column, architectural, J. M. Larimer	484,316 484,085 484,127 484,026	Plo Plo Plo
	Cock, gauge, J. F. Holdam. Coller, cuff, and garment rack, H. Caspar Colter, plow, G. C. Westervelt. Column, architectural, J. M. Larimer Converters, lining for Bessemer, C. W. Bildt Cork, treating, J. T. Smith Corn husker, M. Wilson. Corners, covers, and like parts for books, boxes, ate, of celluloid or kindred material making.	484,026 484,286 484,345 484,076	Plo
	A. C. Hafely	484,006	Plo Pn Po Po
	Coupling. See Air brake coupling. Car coupling.	484,337 484,059	Po Pri Pri
	Curtain rods combined socket, and bracket for		Pro Pro Pu Pu
	Cutter. See Butter cutter.	484,028 484,221 484,290	Pu Pu Pu
	Decorticating grain, J. Sloan Dental instrument, J. C. Blair. Desk, sectional, W. A. Eaton	484,258 484,287 484,357	Pu
	Cutter head, rosette turning, R. B. Moore Cycle saddle, J. B. Brooks. 484,289. Decorticating grain, J. Sloan. Dental instrument, J. C. Blair. Desk, sectional, W. A. Eaton. Door closer, H. Bunker. Door hanger, C. D. Lawrence. Draught equalizer, T. Keller. Dress, M. K. Staab. Drilling machine, H. H. Wilderman.	483,989 484,157 484,371 484,257	Qu Ra Ra Ra
	Draught equalizer, T. Keller Dress, M. K. Staab. Drilling machine, H. H. Wilderman. Drinking trough, G. S. Singer Dry closet, W. D. Dickson. Dumbhell, C. W. Ayton Dust collector, J. J. Gerard. Dyeing, E. Zillessen. Eves trough hanger, W. E. Tuller. Electric switch, M. R. Utley Electrical depositing meter, T. A. Edison. Electrical distribution, system of, H. W. Leonard	484,270 484,057 483,997	Ra Ra Ra
	Dust collector, J. J. Gerard. Dyeing, E. Zillessen. Eaves trough hanger. W. E. Tuller.	484,090 484,080 484,347	Ra Ra Ra Ra
	Electric switch, M. R. Utley Electrical depositing meter, T. A. Edison Electrical distribution, system of, H. W. Leon- ard	484,380 484,183	Ra Ra
	Engine. See Gas engine. Steam engine. Envelope, J. W. Kohn	484,372 484 109	Ra Ra Ra
			Ra Ra Re
	D. A. Robinson. Feed hag holder, J. H. E. Zeip. Feed bor regulator, A. A. Morris. Feed regulator, M. A. Swing. Feed regulator, M. A. Swing. Feed trough and rack, combined, J. W. Moore. Feeding mechanism, L. C. Crowell.	484,064 484,037 484,141	Re
	Fence, J. T. Lucas Fence, L. S. Safford Fifth wheel, S. H. Sexton Wile. letter. H. L. Sawyer	484,245 484,378 484,247	Ro Ro Ro
	Feeding mechanism, L. C. Crowell Fence, L. S. Saford. Fifth wheel, S. H. Sexton Fife, letter, H. L. Sawyer File, paper, O. F. Westrup. Fire paper, O. F. Westrup. Fire alarm, electric, H. Cortland Fire dog and grate, Sombined, G. T. Glascock. Fire escape, A. V. Goltermann. Fire escape, A. V. Goltermann. Fire escape, P. B. Sullivan. Fire escape, P. B. Sullivan. Fire hynaper, sticky, O. & W. Thum (r). Folding chair, H. A. J. Rieckert. Folding chair, D. A. Sinsabaugh. Folding mechanism, L. C. Crowell Frame. See Leather frame.	484,267 484,140 484,091	Ru Sa Sa
	Fire escape, A. V. Goltermann. Fire escape, Murphy & Rankin. Fire escape, P. B. Sullivan. Fly paper sticky O. & W. Thum (r)	484,042 484,260 11,276	Sa Sa Sa
	Folding chair, H. A. J. Rieckert. Folding chair, D. A. Sinsabaugh Folding mechanism, L. C. Crowell	484,258 484,058 484,142	Sc
	Fruit pitter, G. C. Howell	484,154 484 Me	Se
•	Fumes from metallurgical furnaces, device for catching and saving, M. W. Iles. Furnace. See Basic lined furnace. Blast fur- nace. Boiler furnace.	484,017	Se Sh Sh
	Furnace for metallurgical operations, J. N. Lauth. Furnace for metallurgical purposes, J. N. Lauth-Furnace top, blast, M. W. Hes.	484,329 484,328 484,018	Sh Sh
	Lauth Metaluirical Operatons, J. N. Lauth-Furnace for metallurgical purposes, J. N. Lauth-Furnace top, blast, M. W. Hes. Gauge. See Sugar alarm gauge. Galvanic battery, J. W. Hoffman. Game apparatus, H. J. Saxton. Game board, parlor bowling, P. H. Colell. Garment fastener, F. E. Bennett. Garment, suspensory, C. C. Taylor. Gas engine, J. Wehrschmidt. Gate. See Bridge gate. Gate, W. T. Harris.	484,096 484,115	Sh
	Garment fastener, F. E. Bennett	483,988 484,065 484,168	Sh Sh Sh
	Gate. See Bridge gate. Gate, W. T. Harris	484,198	Sh Sh Sh
	Glue applying apparatus, J., Sr., & L Luger Glue heater, J. Luger, Sr. Gun, multicharge, J. R. Haskell484,007, 484,010	484,131 484,031 484,032 484,011	Sig
	Glassware, device for manufacturing hollow, T. B. Atterbury. Glue applying apparatus, J., Sr., & L. Luger. Glue heater, J. Luger, Sr. Gun, multicharge, J. R. Haskell 484,007, 484,010, Gun, multicharge or accelerating, J. R. Haskell Guns, apparatus for working disappearing, Noble & Murray. Hame clip, J. Scott. Hame fastener, E. Beaubien. Hame fastener, E. Lambert. Hanger. See Door hanger. Eaves trough hanger.	484,009 484,374 484,053	Sig
	Hame fastener, E. Beaubien Hame fastener, R. Lambert Hanger. See Door hanger. Eaves trough	484,053 484,283 484,327	Sin Sk Sli Sp
9	Handle. See Auger handle. Harrow, V. E. Randall		Sp Sp Sp
)	Heating and ventilating apparatus, A. Willgeroth	484,272	Sp
,	Hem folder and presser, F. Henry	484,083	1
1	Hinge, blind, A. J. Avery. Hinge, lock, C. E. Gillespie. Hinge, spring, Held & Pattesson.	484,351 484,361 484,200	Sta
3	, , , , , , , , , , , , , , , , , , , ,	484,358	Sta
3	holder. Hoop pointing and lapping machine, A. F. Ward. Horse shield, C. H. Baldwin.	484,126 484,282	Su
1		484,220 484,190	Su
)	Hose clamps, device for applying, Z. L. Chadbourne et al. Hydrant, J. A. Gregg. Liculator, I. Wilden	484,298 484,197 484 205	Ta Ta Ta
2	bourne et al. Hydrant, J. A. Gregg. Incuhator, L. Kuhner. Index, M. S. Ford. Injector, automatic restarting, W. Penberthy	484,151 484,044	Te Te

1	Inkstand, fountain, E. C. Mayloy. Insulator, F. M. Locke, A. Anderson Insulator, troller with the standard from Jar covers, took founding fruit, J. Van Altena. Jar covers turk's bead roll, F. Mossberg.	484,106 484,209 484,280 484,070
	Jeweler's turk's bead roll, F. Mossberg	484,365
	Journal bearing, W. Curran Kettle, confectioner's, W. Brierley	484,143 484,134
	Lamp, eentral draught, N. Roitman. Lamp, electric arc, J. A. Hayes. Lamp extinguisher. M. Goetze. Lamp except incondescent electric C. J. Klein.	484,323 484,242 484,199 484,362 484,207
3	Neville	484,277 484,317
	Lawn sprinkler, G. Carlson Lawn sprinkler, D. C. Wilgus Lead or crayon holder, C. W. Boman Leather dressing or finishing machine, L. E. Lea-	484,294 484,074 484,133 484,029
5	royd Leather frame, L. F. Canffield Lifter. See Joist lifter. Lighting device, hydrocarbon, Cody & Lawton	484,137 484,354
9	Lights, apparatus for regulating the intensity of incandescent, J. F. McEiroy. Log loader and turner, W. E. Hill Loom let-off mechanism, I. Fontaine.	484,110 484,013 484,002 484,326 484,364
5		484,364 484,196 484,238 484,253
3	Lubricator. See A Me Indricator. Lubricator. J. Greer	484,253 484,311 484,264
5	Trist. Metal shears. E. T. Horner	484,370
675	Ites. Melting pot, R. S. Pease. Mortising machine attachment, J. B. Nichols. Motor. See Machine motor. Water motor. Music, apppratus for writing, A. Tessaro. Nickel from ores, extracting, T. Macfarlane. Nut lock, Huber & Ervin. Nut lock, Huber & Ervin. Optometer, focal center, J. S. Sherman. Ordnance, J. R. H. skell. Ores, reduction of complex, W. C. Wetherill. Packing case, J. Chase Packing, piston, F. N. Ethridge. Paper bag machine, F. L. Baker. Paper folding machine, J. Carnes. Paper slitting and winding machine, A. P. Brown Paper stock grinding machine, M. H. Simonet. Pattern for draughting garments, J. H. Cho-	484,161 484,225 484,262
8	Nut cracker, O. H. Robertson. Nut lock, Huber & Ervin. Optometer, focal center, J. S. Sherman.	484,083 484,049 484,204 484,055
8	Ordnance, J. R. H. skell. Ores, reduction of complex, W. C. Wetherill Packing case, J. Chase Packing, piston, F. N. Ethridge	484,012 484,269 483,991 484,188
8 9	Paper bag machine, F. L. Baker. Paper folding machine, J. Carnes. Paper slitting and winding machine, A. P. Brown Paper stock grinding machine, M. H. Simonet	484,281 484,295 484,173 484,056
6	Pearl, etc, implement for cutting, F. Wilkie	484,138 484,075 484,071
0	Pencil sharpener, F. J. Walker. Photographer's background holder, W. I. Scand- lin. Photographic printing frame, F. O. Bynoe. Pick, Mitchell & Birkinshaw.	484,165 484,175 484,833
8465	Picker. See Bean picker. Plants and press adapted therefor, pressing and dryling, R. H. Day. Plow, U. A. Cleveland. Plow, W. W. Davis. Plow, G. C. Westervelt. Plow, combined riding and walking gang, A. M.	484,301 484,178 483,994
665	Plow, W. W. Davis. Plow, G. C. Westervelt. Plow, combined riding and walkinggang, A. M. Fitch.	
6	Fitch Plow, hillside, C. P. McWane Plow, side hill, G. C. Westervelt. Pneumatic chair, A. P. Watson. Pocketbooks, etc., frame for, E. Oldenbusch. Pole, tubular metallic, D. Dorward.	484,043 484,128 484,072 484,111
7	Power transmitter, A. S. Tragethon	484,144 484,066 484,040
969	Privy, P. Mueller. Projectile, J. R. Haskell. Propeller, screw. C. B. Wattles. Pulley, wood spit, D. A. Sprinkle. Pulley, wood spit, D. A. Sprinkle.	484,040 484,008 484,382 484,167 484,139
8	Pump, E. H. Weatherhead. Pump and water elevator, force, M. L. G. Wheeler. Pump, steam, G. J. Roberts. Puncbin g and shearing machine, combined metal,	484,383 484,169 484,241
8 7 7 9	E. T. Horner	484,369
1 57	Purse, S. C. Langfeld. Quarry frame bar, H. C. Sergeant. Rack, See Collar, cuff, and garment rack. Rail joint, W. Curtis. Rail joint, M. C. Niles. Rail joint, J. H. Rouse.	404 041
772	Rail joint, J. H. Rouse. Rail, track, Hill & Meiring. Railway, W. Latimer. Railway crossing, M. G. Knight. Railway gate, C. A. Snider. Railway signal, E. Urbain. Railway switch, electrically-operated, Stone &	484,315 484,027 484,100 484,256
17 10 13	Railway signal, E. Urbain. Railway switch, electrically-operated, Stone & Webster. Railway tte and fastening, Moore & Hodgson Railways, automatic block signal for, S. J. Stuc-	2011160
18	Rake and broom, combined, J. W. Koonce Ram, hydraulic, L. T. Webster	484,062 484,156 484,266
18	Razor, safety, E. L. Schmitz	484,116
39 54 37	Refrigeration, electrical, M. W. Dewey	
15 18 17	Roofing joint, W. H. Jellison	484,366 484,266 484,320 484,077
40 91 93	Sash fastener, J. C. Plunkett	484,046 484,149 484,235 484,332
12 30 76	Sawmill dog, Martin & Hanna Sawmill set works, H. Gawley. Saw tooth swage, W. W. Ryder. Saw ng machine, automatic cut-off, E. Fischer Scalpel, lpurifier, and grader, combined, N. W.	484,360 484,163 483,998
58 12 54	Holt. Soral agricultural, R. E. Wilson Soral agricultural, R. E. Wilson Sorew and clamp, box, Milier & Farrow. Sorewariver, Gay Farsons Seat, T. H. Hicks.	484,202 484,273 484,159 484,004 484,367 484,120
16 17	Seat, T. H. Hicks	484,120
29 28 18	Shafting support, J. A. Evans Sharpening matcher heads, machine for, W. E. Hazard Shears. See Metai shears. Sheep shears. Sheep shears, J. D. Todd Sheet delivery mechanism, W. Scott Sheet metal cans. machine for making. G. B. Hop-	. 484,094 . 484,378 . 484,251
96 15	per	484,014
87 88 65 68	Shingle, metallic, D. D. Lupton	484,112 484,211
98 31	Shirt bosom, A. Rothe. Shoe fastener, Hamill & Johnson. Shoe fastening, G. W. Watson. Shutter opener, A. H. Hull. Sifting and sorting flour or meal, machine for,	484,313 484,381 484,098
31 32 11)9	Sign, A. L. Brumfield	484.174
74 53 33	Sinker, D. W. Settle	484,206
47	Skate sharpener. C. Holland. Silcer. Fruit or vegetable, S. M. Jones. Speed recorder and odometer, O. J. Fuchs. Spindle support, W. F. Draper. Spoon holder, G. W. Babcock. Spring hook, J. C. Newey.	484,156 481,155 484,356 484,081
47 72	Sprinkler. See Lawn sprinkler. Sprocket wheel, variable pitch, F. Gleason Square folding, J. C. Sweet	484,005
83 86 47	I steam combine and advomante parting and out on	
51 51 50 52	device, F. Balbian Steam engine, M. Ulrich. Steam generator, W. J. Ranton. Steam separator, D. Cochrane Steaming apparatus grain, H. S. Jeweli. Stereotype plate and holder, M. Bennitt. Stove, M. Nison Stove, Ruehle & Schmidt. Stove, Ol, R. Z. Liddle. Strainer for mixed drinks, W. Wright. Street cleaning machine, R. W. Furnas 484,181, Sugar gauge for vacuum pans, E. H. Duhme. Suspenders, H. A. Hempel.	483,992 484,092 484,082
58	Stove, Ruehle & Schmidt	484.113 484.030 484.276
26 82 16	Street cleaning machine, R. W. HURBS	. 484, 141 484, 096 484, 336
20 90 98		
97 25 51 44	Switch operating device, G. Schumacher. Table attachment for bedsteads, C. C. Elston Taper for night lights, E. Ludde Telegraph. railway train, M. S. Relley Telephone, magnetic, C. S. Forbes Tether, animal, R. E. Robison Thill coupling, W. M. Sayre	484,375 484,377 484,377 484,050
•		-,

Thread appearing for forming a knotless P M	
Thread, apparatus for forming a knotless, R. M. Macintosh Ticket, railway, Lomax & Anderson	484,212
Ticket, railway Lomay & Anderson	484,331
Tie. See Railway tie.	202,002
Tie. See Railway tie. Tire, bicycle wheel, G. A. Burwell	483,990
Toe weight, C. C. Jerome Tongs, flooring and ceiling, S. L. Clements Toy ball, W. J. Faulkner Toy, smoking, J. T. Craw Trolley wire cleaner, E. B. Smith	484,022
Tongs, flooring and ceiling, S. L. Clements	484,299
Toy ball, W. J. Faulkner	484,189
Toy, smoking, J. T. Craw	484,180
Trolley wire cleaner, E. B. Smith	484,344
Trough. See Drinking trough.	404 015
Trough. See Drinking trough. Trousers, Huffman & Le Favour. Trunk M. J. Michelson	484,015
Trunk M. J. Michelson Trun, Gutbier & Koch. Type making machine, A. T. Brown. Typewriter cabinet, A. T. Brown. Typewriting machine, W. J. Barron, et al. Type writing machine, J. N. Maskelyne, Jr. Valve, D. L. Whittingham. Valve, balanced slide, F. R. Skidmore. Valve, balanced slide, F. R. Skidmore.	404,217
Tun, Gutbler & Koch	404,014
Type making machinet A. T. Brown	484 136
Typewriting machine W. J. Barron et al	484 132
Type writing machine, J. N. Maskelyne, Jr.	484.035
Valve. D. L. Whittingham	484.384
Valve, balanced slide, F. R. Skidmore	484,060
Valve, elevator auxiliary, A. J. McAdam Valve operating mechanism, J. Wagner	484,223
Valve operating mechanism, J. Wagner	484,265
Valve, steam engine, H. Denney	483,996
Valve operating mechanism, J. wagner. Valve, steam engine, H. Denney. Vapor burner, J. R. Sapp. Vehicle body, T. Faulder. Vehicle running gear, R. L. Ellery. Vehicle running gear, E. Storm. Ventilating, refrigerating, heating, etc., carriages, halls, or rooms, apparatus for, H. & T. A. Carter.	484,114
Vehicle body, T. Faulder	484,085
Vehicle running gear, R. L. Ellery	484,186
venicle running gear, E. Storm	484,209
ringer belle or rooms appearing, etc., car-	
A. Carter	484 953
Ventilator See Shin's ventilator	202,000
Vessel, wooden liquid containing, J. M. Schoffeld.	484.249
Vise. W. Mann	484,213
Ventilator. See Ship's ventilator. Vessel, wooden liquid containing, J. M. Schofield. Vise, W. Mann. Wagon brake, B. F. Fleshman. Wash bench and wringer support combined, W. F. Parmelee.	484,001
Wash bench and wringer support combined, W.	
F. Parmelee	484,160
Watch case pendant, D. H. Church	484,177
Watch holder, R. Fuchs	484,003
Watch regulator, D. H. Church	484,176
Watch, stem winding and setting, J. E. Fultz	484,359
Water closet coupling, G. B. Howell	404,010
Water bester T W Volley	404,400
Water heating system F A & F. N Cates	484 193
Water motor, C. L. Wilkins	484.271
Weather strip. E. A. Delancy	483,995
Well or cistern cleaner, J. W. Master	484,214
Wash bench and wringer support combined, W. Parmele Watch case pendant, D. H. Church Watch case pendant, D. H. Church Watch botter, R. Fuchs. Watch regulator, D. H. Church Watch regulator, D. H. Church Watch, stem winding and setting, J. E. Fultz. Water closet coupling, G. B. Howell Water heater, J. W. Kelley. Water heating system F. A. & E. N. Gates Water heating system F. A. & E. N. Gates Water motor, C. L. Wilkins. Weather strip, E. A. Delancy. Watch restrip, E. A. Delancy. Well or cistern cleaner, J. W. Master. Wells, apparatus for inserting or withdrawing casing for oll or like, C. A. Sargert. Wheel, See Fifth wheel. Sprocket wheel. Whell guard, P. J. Connell. Whip socket, E. N. Tuttle. Winding yarn or thread, machine for, R. Broadbent.	
casing for oil or like, C. A. Sargert	484,051
Wheel. See Fifth wheel. Sprocket wheel.	
Wheel guard, P. J. Connell	484,300
Whip socket, E. N. Tuttle	484,067
winding yarn or thread, machine for, R. Broad-	404 171
Windmill tower 1 I uges	404,171
Window clospon M. I. Pocker	404,100
Window screen frame I F Rutcher	494 999
Windmill tower, J. Luger. Window cleaner, M. J. Becker. Window screen frame, J. F. Butcher. Wire stretcher, J. Spillinger. Wood, manufacture of parquetry or inlaid, H.	484 061
Wood, manufacture of parquetry or inlaid. H.	102,001
Studte	484,063
Wrench, P. Brolin	484,288
Studte Wrench, P. Brolin Wrench, Fields & Duvall	484,307
Wrench, Miles & Commander	484,218

DESIGNS

Badge, Connolly & Sealy	
Badge, C. Pettibone	21.886
Engine frame, D. Best	21.887
Heel protector, F. J. Herrick	21,889
Match box. L. F. Hurd	21,893
Spoon, H. J. Heinz	21.895
Spoon, T. B. Myers	21,894
Stove, Thissell & Wilder	21.896
Stove, cooking, Bascom & Ritchie	21.897
., ., ., ., ., ., ., ., ., ., ., ., ., .	,

TRADE MARKS.

TITLE MITTER.	
Beer, W. Forster. 21,858, Bread, biscuits, cakes, and crackers, W. J. Meikle-	21,859
ham	21,861
Chemical products derived from sugar, Schering & Glatz.	91 004
Fish, oysters, and other shell fish packed in tin and	21,002
Fish, oysters, and other shell fish packed in tin and glass, H. Ruge & Sons. Henriettas, all wool, M. Riedel.	21,863
Ointments, pills, and medicated soap, Livura Manufacturing Co	
Preparations for the cure of piles and kindred	
diseases, F. Eaton Remedy for diseases of the liver and skin, O. L. Mulot	91 000
L. Mulot	41,862

A printed copy of the specification and drawing of any patent in the foregoing list, or any patent in print issued since 1863, will be furnished from this office for 25 cents. In ordering please state the name and number of the patent desired, and remit to Munn & Co., 361 Broadway, New York.

Canadian patents may now be obtained by the in ventors for any of the inventions named in the for-going list, provided they are simple, at a cost of \$40 each. If complicated the cost will be a little more. For full instructions address Munn & Co., 361 Broadway, New York. Other foreign patents may also be obtained.

Advertisements.

Inside Page. each insertion - - 75 cents a line Back Page. each insertion - - - 73 cents a line
The above are charges per agate line—about eight
words per line. This notice shows the width of the line,
and is set in agate type. Engravings may head advertisements at the same rate per agate line, by measurement, as the letter press. Advertisements must be
received at Publication Office as early as Thursday
morning to appear in the following week's issue.

ADAMANT WALL PLASTER BEST PLASTERING MATERIAL MOWN. No experiment. Its success has been guenomenal. Thirty factories in this and other countries. ADAMANT MFG. CO., STRACUSE, N. Y.





ACENTS WANTED

In every County throughout the United States to handle our fast-selling specialties; will sell in every home. Send two cent stamp for illustrated catalogue, terms, etc.

ELECTRO-NOVELTY CO. 5-10 AMORY AVENUE, ROXBURY, MASS.

N.B.—For description of Toy Motors mamfactured by us, see July 23d issue Scientific American.

The Sebastian-May Co

Improved Screw Cutting
Foot & LATHES
Power LATHES

Drill Presses, Chucks, Drills, Dogs and Machiniste' and Amatehrs' outfits. Lathes on trial, Catalogues mailed on application.

165 to 167 Highland Ave.. SIDNEY, OHIO.



T. A. G. THE TUSCARORA ADVER-TISING COMPANY, Manufac-turers, Publishers and Importers of buy good specialties outright or manufacture on royalty. Salesmen cover every State and Territory in the Union.

BEATTY Pianes, Organs, \$33 up. Want agents, Cat'g free, Dan'l F. Beatty, Wash'ton, N. J.

ELECTRIC POWER APPARATUS.

FOR EVERY VARIETY OF MECHANICAL WORK.

SAFE, SURE, RELIABLE.

SEND FOR CATALOGUES. ESTIMATES FURNISHED. THOMSON-HOUSTON MOTOR CO.,

620 ATLANTIC AVENUE, BOSTON, MASS

PUMP, GRIND, CUT FEED, and SAW WOOD.



AERMOTOR CO. 22 Beale St., San Francisco

VOLNEY W. MASON & CO., FRICTION PULLEYS, CLUTCHES, and ELEVATORS PROVIDENCE, R. I.



OIL WELL SUPPLY CO.

91 & 92 WATER STREET,
Pittsburg, Pa.,
Manufacturers of everything needed for
ARTESIAN WELLS
foreither Gas, Oil, Water, or Mineral
Tests, Boilers, Engines, Pipe,
Cordag e, Drilling Teols, etc.
Illustrated catalogue, price
lists and discount sheets
on request.

FOR RENT, WATER POWER.—Day use of 25° 25° h.p. (night power used for Electric Light plant). Good railroad facilities. Town of \$0.000 population. Address Riverside Water Company, Riverside, California.



ALUMINUM: ITS USES AND AP plications. A valuable and interesting article by G. L. Addenbrooke. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, NO. 859. Price 10 cents. To be had at this office and from all newsdealers.

Industrial, Manufacturing, and Uncurrent SECURITIES DE ALT IN.

WORDEN & FANSHAWE,
9 WALL ST., NEW. YORK



Steel Type for Writing Machines, J. D. MALLONEE, M'f'r, STOCKTON, N. Y.

ELECTRIC MINING APPARATUS, **ELECTRIC MINE LOCOMOTIVES**

ELECTRIC VENTILATING FANS ELECTRIC HOISTS & ELEVATORS **ELECTRIC COAL CUTTERS.**

GENERAL ELECTRIC COMPANY, MINING DEPARTMENT.

622 ATLANTIC AVENUE, BOSTON, MASS.

173-175 ADAMS STREET, CHICAGO, ILL.

HARRISON CONVEYOR!

Handling Grain, Coal, Sand, Clay, Tan Bark, Cinders, Ores, Seeds,&c. $_{
m Circulars.}^{
m Send}$ BORDEN, SELLECK & CO., ${
m Sole \atop Manu'Pers}$, Chicago, IIL

Improved Screw Cutting Foot and Power

Drill Presses, Shapers, Band, Circular, and Scroll Saws.
Machinists' Tools and Supplies. Lathes on trial.

Catalogue mailed on application. SEBAS'TIAN LATHE COMPANY,

120 and 122 Culvert Street, Cincinnati, O.



AUTOMATIC TIME RECORDER.

Every employe keeps his own time. imple, accurate, economical. Manufactured by

BUNDY MFG. CO. Binghamton, N. Y. Send for circular.

"THE EXPERT" DATING STAMP. Unstrated in Scientific Am. Sep. 3rd, p. 148,
THE GREATEST ADVANCE IN RUBBER DATING STAMPS.
COMPLETE FOR EVERY HOUR IN 10 YEARS,
with Die to order. Post-paid \$2.75. R. H. SMITH MFG. CO., SPRINGFIELD, MASS.
Beleman Metal-Bodied Rubber Type, &c., Catalogue free.

Patent Foot Power Machinery, Complete Outfits.

Wood or Metal workers without steam power can successfully compete with the large shope, by using our New LABOR SAVING Machinery, latest and most improved for practical Shop Use, also for Industrial Schools, Home Training, etc. Catalogue free,



A Manufacturing Firm, with a well equipped factory and agencies established all through the States, Australia, England and France, are prepared to enter into contracts to manufacture novelties, or take up good patents for articles of universal consumption. Correspondence strictly confidential. Apply in first place to MANUFACTURER, Buffalo P. C., N. Y.

SECONDARY BATTERIES.—BY G. H. Robertson, F.C.S. An interesting and valuable paper treating of the types of secondary batteries successfully employed. Historical Notes. Reversible Batteries, Improvements in the Planté System, Electrolytic Processes, Improvements in the Faure Type, Chemistry of the Acid. With 13 figures. Contained in SCIENTIFIC AMERICAN SUPPLEMENT NO. S38. Price 10 cents. AMERICAN SUPPLEMENT. No. 838. Price 10 cents. To be had at this office and from all newsdealers.

QUARTZ FIBERS.-BY PROF. C. VERnon Boys. Description of the author's method of drawing out quartz into a fiber, which, in the measurement
of extremely minute forces, permits of obtaining a
greaterdegree of delicacy than is possible with the existing torsion threads. Application of the fibers to the
author's radio-micrometer for mea uring radiant heat
from such a thing as a candle, 2 are, the sun, etc. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No.
796. Price licents. To be had at this office and from
all new Scients.



odays THE NATIONAL MFG. & IMPORTING CO., only. 334 Dearborn St., Chicago, III.

Model Makers' MODELS Dies, Castings, -Supplies, -Inventions Perfected. Novelty and Duplicate Work. CATALOGUE A. J. Weed & Co., 106, 108 Liberty St., N.Y.

MAGIC MANTERNS AND VIEWS
For Sale and Wanted.
For S

TO INVENTORS.—Assistance given in difficult places. Model and Drawing made. Positive secrecy assured. Charges very light. S. D. JOHNSON, Wallingford, Conn., Expert Watch and Model Maker.

O CELLULOID LACQUERS

AND VARNISHES FOR METAL AND WOOD

AND DEAD BLACKS - SHELL ACS & C



J. B. COLT & CO. 189 La Salle Street, Chicago, Ill.

EXPERT MODEL MAKING. Established 1867.
J. C. SEYL, Prop. Chicago Model Works, Chicago, Ill., 179
E. Madison St. Write for Catalogue of Model Supplies.



THE STIRLING BOILER

is economical in fuel, repairs, and absolutely safe at high pressure. Practically self-cleaning.

THE STIRLING COMPANY, GENERAL OFFICES:

PULLMAN BUILDING, CHICAGO Branches in all principal cities.

[XCELSIOR LANTERN, THE HEADLIGHT OF EDUCATION.

With PATENT ARGAND LAMP, double concentric wick, or with oxy.-hyd. gas jet. Our MULTIFOUAL PATENT LENS makes the picture any desired size.

Send for Catalogueto J. W. QUEEN & CO. PHILADELPHIA, PA.

NOW READY!

A NEW AND VALUABLE BOOK.



12,000 Receipts. 680 Pages. Price \$5.

This splendid work contains a careful compilation of the most useful Receipts and Replies given in the Notes and Queries of correspondents as published in the Scientific American during the past fifty years: together with many valuable and important additions.

Over Twelve Thousand selected receipts are here collected; nearly every branch of the useful arts being represented. It is by far the most comprehensive volume of the kind ever placed before the public.

The work may be regarded as the product of the studies and practical experience of the ablest chemists and workers in all parts of the world; the information given being of the highest value, arranged and condensed in concise form convenient for ready use.

Almost every inquiry that can be thought of, relating to formulæ used in the various manufacturing industries, will here be found answered.

Instructions for working many different processes in the arts are given.

It is impossible within the limits of a prospectus to give more than an outline of a few features of so extensive a work.

Under the head of Paper we have nearly 250 receipts, embracing how to make papier maché; how to make paper water proof and fire proof; how to make sandpaper, emery paper, tracing paper, transfer paper, carbon paper, paper for doing up cutlery, silverware; how to make luminous paper, photograph papers, etc.

Under the head of Ilks we have nearly 450 receipts, including the finest and best writing inks of all colors, drawing inks, luminous inks, unvisible inks, gold, silver and bronze inks, white inks; directions for removal of inks; restoration of faded inks, etc.

Under the head of Alloys over 700 receipts are given, covering a vast amount of valuable information.

Of Cements we have some 600 receipts, which include almost every known adhesive preparaticn,

of Cements we have some 600 receipts, which

include almost every known adnesive preparation, and the modes of use.

How to make Rubber Stamps forms the subject of a most valuable practical article, in which the complete process is described in such clear and explicit terms that any intelligent person ray readily learn the art.

For Lacquers there are 120 receipts; Electro-Metallurgy, 125 receipts; Bronzing, 127 receipts; Photography and Microscopy are represented by 600 receipts.

tography and Microscopy are represented by 600 receipts.
Under the head of Etching there are 55 receipts, embracing practical directions for the production of engravings and printing plates of drawings. Paints, Pigments and Varnishes furnish over 800 receipts, and include everything worth knowing on those subjects.
Under the head of Cleansing over 500 receipts are given, the scope being very broad, embracing the removal of spots and stains from all sorts of objects and materials, bleaching of fabrics, cleaning furniture, clothing, glass, leather, metals, and the restoration and preservation of all kinds of objects and materials.

of objects and materials.

In Cosmetics and Perfumery some 500 receipts

are given. Soaps nave nearly 300 receipts.

Those who are engaged in any branch of industry probably will find in this book much that is of practical value in their respective callings.

Those who are in search of independent business or employment, relating to the home manufacture of sample articles, will find in it hundreds of most excellent suggestions.

Send for descriptive circular.

MUNN & CO., Publishers, SCIENTIFIC AMERICAN OFFICE,

361 Broadway, New York.