Business and Personal.

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

I wish to buy second hand lathes, planers, drills, shap ers, engines, boilers, and machinery. Must be in good order. Will pay cash. W. P. Davis, Rochester, N. Y.

Acme engine, 1 to 5 H. P. See adv. next issue.

Presses & Dies. Ferracute Mach. Co., Bridgeton, N. J. Steam Hammers, Improved Hydraulic Jacks, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

Screw machines, milling machines, and drill presses The Garvin Mach. Co., Laight and Canal Sts., New York. Tight and Slack Barrel Machinery a specialty. John

Greenwood & Co., Rochester, N. Y. See illus. adv., p. 300. Wanted-A first class draughtsman and machine designer with experience. Address C. N. J., box 773, New

Inventive man, with experience in chemistry and en gineering, wants position. Reputation, box 773, New

Wanted—"Agency" for Pacific coast. Some good specialty. Burt, Ramsay & Co., 208 Sutter St., San Fran-

For the original Bogardus Universal Eccentric Mill Foot and Power Presses, Drills, Shears, etc., address J S. & G. F. Simpson, 26 to 36 Rodney St., Brooklyn, N. Y.

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.

Sheet Rubber Packing, 1-16, 3-32, %, 3-16, and 1/4 inch thick, 7½ cents per pound. All kinds of rubber goods a low prices. John W. Buckley, 158 South St., New York.

Position as superintendent or manager in a mfg. establishment: varied practical experience in important positions; fully up in duplicate mfg. and modern prac-tice. "C.," box 773, New York.

For Sale-Two hydraulic presses and pumps, one 2,800 tons capacity, the other 1,000 tons. Estimated weight of the first 40 tons and of the second 27 tons. Have had but triflingusage. Full description and low prices upon application. Address S. C. Forsaith Machine Co., machinists and general machinery dealers, Manchester, N. H.

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



HINTS TO CORRESPONDENTS.

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

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.

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 price.

Minerals sent for examination should be distinctly marked or labeled.

(3314) Experimenter asks how the explosive used for priming cartridges is made and how applied. A. It is made by dissolving 1 part mercury in 12 parts nitric acid, and mixing the product with an equal quantity of alcohol. The liquid is heated to complete the reaction, is cooled, and the fulminate separates. It may be purified by recrystallization. In use it is mixed with sulphur and potassium chlorate or nitrate, and the mixture is secured in place by a drop of

(3315) G. A. W. writes: I have a deposit of kaolin which shows the following analysis Moisture...... 11:35 Alumina 3930

Iron oxide...... 3:04

I also have a deposit of marl which shows by analysis 62 per cent carbonate of lime, and am informed that a combination of the two will make a superior cement Will you please inform me how this can be done. A The only way to make a cement such as you describe is to grind together proper proportions of your materials, make into lumps with water, dry and burn in a kiln. You may experiment on these lines, using an ordinary fire. The result is doubtful.

(3316) H. N. Van T. asks for a recipe for making automatic shading pen ink of various colors. I wish an ink of brilliancy, drying rapidly, and waterproof. Also a recipe for adhesive ink, used in making gold, metallic and other lettering. A. The general basis of such inks is a solution of gum arabic. This is not waterproof. An approximately waterproof body is given by a solution of shellac in borax water. An alcoholic solution of shellac may be used which will be quite waterproof if otherwise satisfactory. Color with aniline colors or diamond dyes.

(3317) G. S. asks: What process shall I have to put cow's horns through, to soften, so that I can twist them in various shapes? A. Boil the horns in soda or potash lye until soft. The horn will be brittle when pressed or moulded. Or try simple boiling water,

(3318) G. E. B. asks for a recipe to make what they call chalk engraving plates, that is the white compound that is on the steel plate. A. See our SUP-PLEMENT, No. 790.

(3319) W. T. V.—The bright metallic particles in the sample sent are iron pyrites of no value. We see no indications of copper pyrites.

(3320) F. J. K. and M. J. M. ask how horn workers soften horn so that it can be made into different shapes. A. The safest way is to use boiling permanently removed; the pan can be japanned, or

water. The moulds, if of iron, may be heated also by immersion in the same water. See query 3317.

(3321) G. J. H. asks how much a cubic foot of gold will weigh, avoirdupois weight. A. About 1209 pounds. It varies slightly, according to the treat ment it has received, whether it is rolled or not, etc.

(3322) "Die Germania" asks for a good receipt for making printers' roller composition, A. Good proportions are 1 pound glue to 1 pint of molasses, Soak the glue in water for 24 hours, then melt with the molasses and cast in a mould previously oiled with

(3323) W. C. P. writes: I notice in your ssue of this date, page 73, the description of a static electromotor devised by Mr. Wimshurst. Is not this motor the same in action as the rotating glass globe with strips of tin foil on it, which, if I remember aright, Mr. George M. Hopkins described several years ago in his series of experiment with the Holtz machine, as published in the SCIENTIFIC AMERICAN? A. It seems to involve the same principle.

(3324) M. M. A. asks: Is there any way of patching rubber goods, such as hot water bags, etc. If so, can you tell me what cement will do it or how to make it, one that will resist the action of hot water? A. The only effectual way to do this is to use a benzole or other solution of India rubber, apply to the surfaces and join, and then vulcanize, by Parke's cold process or otherwise. For general treatment of India rubber re refer you to "Rubber Hand Stamps and the Manipulation of India Rubher," \$1 by mail. No good cement for vulcanized rubber has yet been discovered.

(3325) E. S. desires to learn from Notes nd Queries what application to the human flesh would have a tendency to enlarge or extend the same, so as to make that part appear fat, or, what will hold a swelling created under the vacuum process permanently A. Try vigorous massage.

(3326) C. M. asks for a composition for lining casks and like vessels, stoppers for bottles, etc.-For vessels and stoppers used for beers and ales, the compound not affecting or being affected by acids or other chemicals contained in those liquors. A. The ingredients are as follows, the powdered pipe clay being omitted if the composition is not to be used for moulding stoppers: Shellac 41/2 pounds, resin 11/2 pounds, wood carbon 4 pounds, powdered clay 4 poun wax 1/2 pound. These ingredients are agitated with 11/2 gallons of methylated spirit, which "amalgamates all of them into a compound." Without the clay the compound is semi-liquid, and can be run or brushed over the surface to be coated, and allowed to dry.

(3327) D. D.-Waterproofing composition for stone, bricks, plaster and cement surface One pound of "gum dammar" is dissolved in 1 gallon of hot turpentine or hot mineral spirit, and 2 pounds of paraffin wax added. The paraffin dissolves, and the composition when cold can be brushed on to the surface to be waterproofed. Dirty surfaces should be first cleansed. The compound is kept in jars carefully corked.

(3328) M. T.—For furniture polish. Mix together in or about the proportions given; Linseed oil 1 gallon, butter of antimony from 1/4 to 1 pint, as desired, spirits of wine 1/2 pint, white vinegar 1 quart, gum cassia, a few ounces.

(3329) M. S. K. writes: Southern electrical workers seem to be scarce, so I will give you my experience in this direction. I have constructed several induction coils of different sizes, among them the one described in one of your SUPPLEMENTS, but deviated from instructions by using only eight ounces of No. 35 cotton-covered wire wound in two sections, insulating each layer with three thicknesses of tea paper; sparks realized are nearly half inch in length, without condensers, using three small bichromate cells. Have made telephone and microphone described in "Experimental Science;" they work admirably. I am now making a Blake transmitter. I have also constructed batteries, bells and galvanometers of my own design, and contemplate making simple electric motors, as soon as I can get the material.

(3330) A. W. B. asks (1) for prices of the metals named.

Zirconium. 4,536 " " " Lithium. 4,082 " " " Rhodium..... 2,268 " " 906 " " " Iridium.....

Can you refer me to any work on the production of these metals? A. You will find the subject treated in manuals of chemistry. 3. What is the hardest known metal? A. Manganese is the hardest of twenty prominent metals, according to Bottone.

(3331) B. Y. S. asks: If beeswax is discream, how shall I color it white, also brown? A. White can only be produced by a solid pigment, such as Chinese white. You should start with bleached wax and the lightest colored turpentine. For brown use burnt sienna or prepare an aniline color by solution in water or alcohol and precipitation with a solution of soap.

(3332) W. P. B. writes: Will you kindly inform me through your paper if there is an artificial stone that will answer for posts and how it can be made. A. Best Portland cement 1 part, clean sharp sand 2 parts Make a thick mortar, mix well. dump into a wooden box of the intended form of your post. The cement will be sufficiently hardened for removal from the box in twenty-four hours. To facilitate re moval the box might be made of four separate pieces or staves temporarily held together with iron hoops,

(3333) G. H. I. writes: Will you please state what is the best gum to use on envelopes? A. First quality gum arabic is the best.

(3334) E. M. W. asks: 1. How can I remove rust from tin, say a tin pan used to hold copy cloths for copying letters? A. The rust cannot be

what is better, have a tinned copper pan made, which will last years. 2. How can I prepare and apply copying ink to dried-out typewriter ribbons, either blue or green? A. Typewriter ink is described in the Scien-TIFIC AMERICAN, No. 21, vol. 59, query 15; No. 12, vol. 58; No. 7, vol. 56; query 22, No. 8, vol. 56.

(3335) G. W. O. asks: What date did the 19th century commence, and what time will it expire? A. It began January 1, 1801, and will end December 31, 1900.

(3336) T. G. D. asks: In which number of your paper will I find the explanation of firing a annon ball from a moving train? A. No explanation should be needed. The motion received by the cannon ball is composed of the motion of the train and of the motion imparted by the firing, and may be graphically obtained by the parallelogram of forces.

(3337) M. M. W. asks: 1. In what ways and for what reasons does Siemens producer gas differ from ordinary coal gas used for lighting purposes? A. Producer gas is made by incomplete combustion combined with distillation of the fuel and at the same time by decomposition of water by the hot fuel. It is characterized by the presence of large quantities of nitrogen from the air, and carbonic oxide. Coal gas is made by distillation in a closed retort of bituminous coal, contains very little nitrogen, only a few per cents of carbonic oxide, and the rest is hydrogen and hydrocarbons principally. 2. What substances are used for lighting by incandescence? A. Oxides of the earths, magnesia. limes, zirconia, and others. Some become luminescent at lower temperatures than others, and so far are desirable. Some deteriorate more rapidly than others, which is a bad feature. Many mixtures have been experimented with. 3. How may coal gas be made to give a non-luminous flame? A. By mixing air with it before combustion, as in the Bunsen burner. 4. Why is it that ammonia is found in the products of combustion of carbonaceous fuel? By what means is it extracted and obtained in a form suitable for use in the arts? A. Because the fuel contains nitrogen already combined with carbon and hydrogen. On distilling coal ammonia is evolved, and is washed out with water, whence it is extracted by heating, first alone and afterward with lime. The ammoniacal gas evolved is collected in dilute sulphuric acid, whence ammonium sulphate is produced by evaporation. 5. In what way, and why, does coal belonging to different geological periods differ? A. No very good answer can be given. The coal of the older periods is apt to be more thoroughly compacted and altered than the recent coals and lignites. The latter are nearer in character to the wood and vegetable matter from which all were originally formed.

(3338) E. J. M. asks: What is the lifting power of gas? If a cylinder, 20 feet long, 10 feet in diameter (made of steel strong enough to hold), with a pressure of 200 pounds per square inch, what would be the upward pressure, or how much would it lift? If a vacuum could be made in the same cylinder, would the lifting power be greater or less? Also, how much? A. The more gas is compressed above the atmospheric pressure, the less will it lift. At 200 pounds to the square inch, hydrogen would be almost as heavy as air. and ordinary coal gas would be about six times as heavy, so that the cylinder would fall more rapidly than if filled only with air. Pure hydrogen will lift about 70 pounds to the thousand feet, coal gas about 40 pounds. A vacuum will have slightly greater lifting power than hydrogen, about 5 pounds more to the thousand cubic

(3339) W. L. V. writes: 1. I have a fine film negative which has some small red spots on it. I think that they are silver stains, caused by printing on damp albumen paper. If such, what will remove them? A. Probably they are silver stains. J. V. Drake gives the following directions to remove: Soak the film for five minutes in clean water, meanwhile make a solution of iodide of potassium, 20 grains to an ounce of water. Immerse the film in this for ten minutes. If it is an old stain, immerse for half an hour. Dissolve half a drachm of cyanide of potassium in one ounce of water. Immerse the film in this and rub the stains with a tuft of absorbent cotton until they disappear. If the stains are very old, make the solutions stronger and immerse for longer time. 2. Give a formula for reducing negatives locally. A. To reduce negatives locally dissolve 10 grains of hyposulphite of soda and 5 grains of red prussiate of potash in one ounce of water. Apply to spot with camel's hair brush.

(3340) F. W. S. writes: 1. In your issue of August 22 is not the answer to query 3282 a mistake? I have figures which show the fusing point of platinum at from 3900° to 4000° Fah. A. The figures are erroneous. It should read 3800° Fah., instead of 3080° Fall. Such temperatures are only approximate. 2. What is the highest degree Fah. which can be obtained with ordinary gas blowpipe? A. 6000° to 6800° Fah.

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 law 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, 381 Broadway, New York.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

August 25, 1891.

AND EACH REARING THAT DATE

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

Acid, amido-oxynaphthaline disulphonic, H. Kuzel. Acid, amido-naphthol monosulphonic, H. Kuzel.. 458,28 Advertising apparatus, street, G. W. MacKenzie.. 458,478 Alarm. See Burglar alarm.

		•
1	Amalgamator, T. Shannon 458,50 Animal trap, M. Burton 458,21	2
١	Amalgamator, T. Shannon 58.871 Animal trap, M. Burton 58.211 Animal trap, J. F. Lyons 68.334 Annunciator restoring device, R. P. Garsed 55.344 Armature for dynamo-electric machines, L. A. 56.202 Armature for dynamo-electric machines, L. A. 56.202	0
١	Armature for dynamo-electric machines, L. A. McCarthy	5 4
I		
	Bed bottom, spring, C. F. Phillips. 458.37 Bedstead brace, J. F. Blair. 458.25 Bedstead brace, T. Lonergan. 458.26 Bell ringer or alarm, automatic door, C. A. Emme 458.30	5
	Bell ringer or alarm, automatic door, C. A. Emme 458,30 Belt, skirt, A. A. Alpers. 458,14 Bench dog, J. B. Purssel. 458,18	8 8 7
	Blanket holder, J. F. Taylor	6 1 4
	Bolt or rivet heading machine, Seaton & Miller 458.24 Bottle stopper, Kincaid & Crickler	0 2
	Bell ringer or alarm, automatic door, C. A. Emme 458,36 Belt, skirt, A. A. Alpers. 458,14 Bench dog, J. B. Purssel. 458,14 Bench dog, J. B. Purssel. 458,18 Blanket holder, J. F. Taylor. 458,36 Blotting pad, J. Patterson. 458,36 Boiler tube stopper, W. N. Little. 458,36 Boiler or rivet heading machine, Seaton & Miller. 458,26 Bottle stopper, Kincaid & Crickler. 458,28 Board. See Dash board. Game board. Boiler. See Steam boiler. Tubular boiler. Bolt. See Soor bott. Flour bolt. Rotary bolt. Boots or shoes, shank stiffener for, W. H. Watson. 458,38	
	Dow Con Tournalhow Tottowhow Monowhow	3
	Paper box. Boxes with metal clips, machine for fastening corners of pasteboard, J. Well	.0
	brace. Braiding machine, N. Lombard458,398, 458,470, 458,47 Brake. See Car brake. Power brake. Wagon	1
	Bridge, W. W. Green.	32 4 39
	Bruish, scratch of matting, S. D. Engle	15 27
	Butter cutter, C. N. Shaw)5 12
	Succession Suc	32 30
	Candlestick. F. W. Jenkins. 458,3 Car brake, Pool & Beals. 458,4 Car brake, J. T. Robinson. 458,4	37 97
	Car buffer, J. Green. 458,5 Car coupling, N. F. Brent. 458,3 Car coupling, J. Green. 458,5	32 07 28
	Car coupling, D. T. Nichols. 458,2 Car coupling, A. Wichler. 458,4 Car door lock J. Cohurn. 458,4	37 37
	Car steam heating pipes, coupling for rail, M. Kennedy	50 73
	Car switch attachment. J. M. Pickell. 458,4 Cars, label holder for, O. C. Harris. 458,1 Cars, sand box for street. J. M. Harner 458,1	84 67 66
ı	Carriage tops, machine for trimming, W. B. Quimby	5 2
1	Case. See Clock case. Cash drawer and recorder, combined, W. F. Brown Cash register and indicator Webster & Hyde 458.3	84 41
	Cash drawer and recorder, combined, W. F. Brown	43
?	Chimney platform, J. K. Devore 458,4	16 58
f	Churn, E. E. Birckhead. 458,4 Churn, W. H. Philpot. 458,4 Churn, W. H. Philpot. 458,4	42 82
	Cigar fillers, machine for forming, T. & L. B. Han- cock. 458,2 Cigar or pipe hoider, J. Skuce. 458,5 Circuit closer, P. D. Rich ards. 458,3	71
	Clamp. See Electric da mp.	43
5	Cleaner. See Saw cleaner. Track cleaner. Clock case, J. Dejulio	45
1	Clock, electric alarm, C. Lester. 488,3 Clock, electric alarm, L. Winterhalder. 488,3 Clock, electric alarm, L. Winterhalder. 488,3	72 06
f	Clothes drier, W. F. Redding	18
?	Collar fastener, horse, J. H. Schmitz. 458,2 Combination lock, J. McLane. 458,2	88 104
e	Cleaner. See Saw cle aner. Track cleaner. Cleaner. Cleaner. Clock case, J. Depluio. 458,4	183
8	Greage 488, 1 1 1 1 1 1 1 1 1	169 166
	O Corset, E. J. Swartwout 458,2 Cotton, machine for boiling and cleaning, J. M.	262
n	Cotton, machine for handling and cleaning seed, R. S. Thomas et al	380
	Coupling. See Car coupling. Hose coupling. Pipe coupling. Thill coupling.	2004
1	Cultivator point, A. H. Gaberel	217 396
1	Cutter. See Butter cutter. Cutter bar attachment, Bake & Lacey. 458, Cutting apparatus, C. D. Hillabold. 458,	151 231
	Sampening and copying appliance, J. H. Ander- Sand	513 213
7	Banderson & Reed. 458, Deborner, W. H. Newton. 458, Deborner, W. H. Newton. 458,	501 537
	Desk B. F. & F. D. Fooley 458, Die stock J. M. Carpenter 458, E. Ditching machine, L. H. Turner 458, Ditching ma	220 201
	f Door bolt, T. Lyons	180 357
	Drill. See Grain drill.	E GAO
	Drum and damper for the same, stove, T. Power. 458, Drum and damper for the same, stove, T. Power. 458, Dust from air, process of and apparatus for sepa-	488
1	Drill frame, sen-adjusting, J. Farmer. 458, Drill gauge, Cropper & LOnie. 458, Drum and damper for the same, stove, T. Power. 458, Dust from air, process of and apparatus for separating, O. Kutsche. 458, Dye, azo, H. Kuzel. 458, Dye, induline, B. Homolka. 458, Eggs, compound as a substitute for yelk of, J. E. Eggs, compound as a substitute for yelk of, J. E.	284 281
	Furber. 458, Eggs, substitute for white of, J. E. Furber. 458, Eggs, substitute for white of, J. E. Furber. 458, Electric claym. F. Passysson.	420 419
,	Furber. 458, Eggs, substitute for white of, J. E. Furber. 458, Electric clamp, E. Rasmussen. 458, Electric clamp, adjustable, H. Lemp. 459, Electric conductor, F. E. Degenhardt. 458, Electric current heater, alternating, I. Gutmann. 458, Electric motor, C. E. Egan. 458, Electric motors, operating alternating, L. Gutmann. 458, Electric motors, operating alternating, L. Gutmann. 458, mann. 458,	177 316 162
	Electric motor, C. E. Egan. 458, electric motor, L. Gutmann. 458, Electric motor, L. Gutmann. 458, Electric motors congesting alternating I. Gut	545 162
	at Electric signal and switch moving mechanism, J.	
ŀ	Ramsey, Jr., et al. 458. Electric stop mechanism, E. Boening. 458. Elevator. See Electric elevator. Hydraulic elevator.	
	Elevator, G. H. Reynolds	429 530 296
	Exercising apparatus, G. Zander	,382 .321
n	ne Farmgate, A. L. Gericke	,248 ,504
r	1	,549 ,394 ,312
2	s, Filter, ●. H. & W. M. Jewell. 458 Filter, J. M. Wells. 458 Firearm, magazine, A. Burgess. 458	,368 ,204 ,333
Ć	d- Fire chamber ventilator, P. Abrahamson	,330 ,171 ,456
	Flax thrashing machine, T. Doolan 488 Flour bolt, O. M. Morse. 488 Flour packer, M. W. Lipe. 488	,269 ,305 ,327
`	Flour receptacle, F. Schafstall 458 Forceps joint, F. A. Reichardt 458 Frame. See Drill frame.	,192 ,254
	Hydrocarbon furnace Furnace, W. Tomilson 456 Furnace, G. W. & A. W. Walker	,295 3,245
,	Furnace, G. W. Wood 458 Furnace, G. W. Wood 458 Furnace grate, G. W. Wood 458 Gauge. See Drill gauge.	,207 ,200
	Game apparatus, J. H. Nolan	,405 ,451
•	Game board, W. G. Bullen. 456 Game board, H. C. Manning. 456 Game or puzzle apparatus, C. P. Blinn. 456 Gas lighter, electric. H. A. Pinkham 459	,401 ,297
2	Furnace. See Heating furnace. Hot air furnace. Hydrocarbon furnace 45	,151 378
•	gate.	

156		
Glass, etc., composition of matter for use as a substitute for, F. Eckstein.	458,157	20000
Glass, etc., composition of matter for use as a substitute for, F. Eckstein. Glassware, machine for blowing, D. C. Ripley Glassware, machine for forming, D. C. Ripley Glassware, manufacture of, D. C. Ripley Glove, H. L. Heath Grader, road, L. Kniffen	458,191 458,189 458,326	S
Glove, H. L. Heath Grader, road, L. Kniffen Grain binder, J. R. Severance. Grain binding machine, S. L. McColloch. Grain drill, B. E. McSherry. Grain scourer, H. H. Ring Grates, vapor forming attachment for, M. Noble Guard. See Saw guard. Ve bicle wheel guard.	458,234 458,553 458,261	S S S S S S S S S S S S S S S S S S S
Grain drill. B. E. McSherry. Grain scourer, H. H. Ring	458,371 458,495 458,328	SSS
Guiding and gauging implement for masons, J. I.		SSSS
Kelley Gun carriages, self-acting brakefor, A. T. Resow Gun, macbine, T. R. Cook Gun, pneumatic, J. R. N. Owens Guns, by dropneumatic operating mechanism for,	458,268 458,329	S
Guns, mechanism for extracting and inserting breech plugs of beavy, H. A. Spiller	458,508 458,355	5555
H. A. Spiller. Guns, mechanism for extracting and inserting breech plux of beavy, H. A. Spiller. Hame, J. J. Baskfield. Hame fastener, J. C. Covert. Handle. See Saw bandle. Hangers. See Car step banger. Harness. Sears & Tuttle. Harvester, N. L. Darling.	458,415	Sı
Harvester, N. L. Darling	458,430 458,335 458,365	S
Harness, Sears & Tuttle. Harness, Sears & Tuttle. Harvester, N. L. Darling. Harvester, corn, W. W. Harvey. Harvesters, automatic cord gripper for self-binding, A. B. Lang. Heater, See Electric current heater. Heater, W. S. Essick. Heating apparatus, J. W. Smith. Heating furnace, J. Gibbons. Henp breaking and cleaning machine, J. Heaney. Heating furnace, J. Gibbons. Henp breaking and cleaning machine, J. Heaney. Holder, See Blanket holder. Broom holder. Cicar and pipe holder. Paper rol. holder. Sash holder. Cultrello or shade holder. Horseshoe, E. Mathis. Hose coupling, T. D. Greene. Hot air furnace, J. W. Connery. Hot air furnace, J. McCowatt. Hot air register, P. I. Miller. Hydraulic elevator, R. T. Crane. Hydraulic ginder, W. R. Hinsdale. Lee making and refrigerating machine, W. H. Appleton.	458,467 458,385 458,197	SISI
Heatingfurnace, J. Gibbons. Henry breaking and cleaning machine, J. Heaney Holder. See Blanket holder. Broom holder.	458,324 458,318	55555555
Sash holder. Cultrella or shade holder. Horseshoe, E. Mathis	458,181	St
Hot air furnace, J. W. Connery. Hot air furnace, D. McCowatt. Hot air register, P. I. Miller.	458,477 458,403	Sisi
Hydraulic elevator, R. T. Crane. Hydrocarbon furnace, C. M. Gearing. Ice cream freezer, E. l. Drake.	458,223 458,390 458,543	SSSSS
Ice making and refrigerating machine, W. H. Appleton Ice pick, shaver, and scoop, combined, F. K.	458,440	TT
pleton. Ice pick, shaver, and scoop, combined, F. K. Kaiser	458,383 458,551 458,221	ТТ
dint. See Forceps joint. Friction joint. Rail		Т
Journal bearing, cage for, E. W. Cooke. Journal box, • S. Hawyer. Kitchen utensil, E. E. Larkins.	458,52 0 458,317 458,175	T T
Ladder, step, A. Johnson. Lamp. C. H. Van Hise.	458,343 458,401 458,509	TTTTT
Lamp, electric arc, N. M. Garland	458,389 458,500 458,376	T
Knife, scissors, or shears sharpener, G. H. Townsend Ladder, step, A. Jobnson. Lamp, C. H. Van Hise. Lamp, electric arc, N. M. Garland Lamp, electric arc, H. W. Sander Lamp, electric arc, H. W. Sander Lamp electric arc, W. S. Richards Lamp, portable electric, L. Bristol. Lamp socket, electric, H. E. Swift Lantern, R. J. Armour Lantern, R. J. Armour Lantern and vehicle heater combined, G. W. Baker	458,242 458,354 458,341	TTTT
Lantern and vehicle heater combined, G. W. Baker. Lathe head, M. C. Johnson. Leather skiving machine, W. H. Kimball. Letter box for collection and delivery, W. Scott. Lifting jack, R. Robinson.	458,150 458,423 458,535	TTT
Letter box for collection and delivery, W. Scott Lifting jack, F. Robinson Lighter. See Gas lighter.	458,273 458,255	T
Lighter. See Gas li inter. Line or rein grip, M. L. Schoch. Linotype machine, J. •. Clephane. Lock. See Car door lock. Combination lock. Nut lock.		U
Locomotives, exhaust nozzle for, Pitkin & Lane	458,370 458,320 458,450 458,173	V
Mailting, apparatus for pneumatic, J. Kuntze	458,174 458,351 458,225	Ş
Marking letters to indicate that they have been copied, F. D. Earll. Measuring jacket, garment, W. G. Venner Mechanical movement, W. Kech. Mecbanical movement, W. B. Willcox. Metal basket, C. C. King. Metal basket, C. C. King. Metal plate, ornamental, E. C. Ewing. Metal strips, stiffening and increasing the resiltency of, W. H. Watson. Metallic vessel, W. W. Fint. Metallic vessel, W. W. Fint. Metallic wheel, W. P. Bettendorf. Middlings purifier, E. B. Whitmore. Mik cash, R. A. Kaestner. Mik testing apparatus, D. T. Sparples.	458,263 458,303 458,347 458,233	V
Metal plate, ornamental, E. C. Ewing. Metal strips, stiffening and increasing the resilt- ency of, W. H. Watson.	458,381	V V V
Metallic vessel, W. W. Fint. Metallic vessel, L. Sturges. Metallic wheel, W. P. Bettendorf	458,361 458,352 458,412 458,410	V
Milk testing apparatus, centritugal, D. T. Sharb-		V
les. Mill. See Quartz mill. Milling machine, A. T. Gifford. Mining machine, electric coal, E. C. Murran. Minnow bucket, automatic "rating, E. Wilbans. Mirror support, adjustable, R. P. F. Wilbans. Mirror support, adjustable, R. P. F. Buck. Mole trap, G. Ricardo. Money lox, registering, J. T. Mahoney. Mortar carriage, F. R. Tawlor.	458,194 458,325 458,184	v v
Minnow bucket, automatic floating, E. Williams. Mirror support, adjustable, R. P. F. hot. Molasses gate, automatic stop, S. P. Buck.	458,529 458,227 458,313	V
Mole trap, G. Ricardo. Money low, resistering, J. T. Mahoney. Mortar carriage, F. B. Taylor. Mottar waste, and Scrapbag, machine for treating, E. D. Emerson. Motor. See Ejectric motor. Music stands, leaf holder for, J. R. Wilkins. Music, time annunciator for, W. K. Lord. Musical instrument, J. S. F. Pizzuti. Nail machine, wire, A. B. Glover. Napping machine. Nut lock, W. B. Reynolds.	458,493 458,400 458,554	V
ing, E. D. Emerson	458,229 458,438 458,251	V
Musical Instrument, J. S. F. Pizzuti. Naji machine, wire, A. B. Glover. Napping machine. A. Mullers. Nut lock, W. B. Reynolds.	458,338 458,391 458,185 458,409	V
Ordnance, breech-loading, E. Von Skoda Packing extractor, A. Goodrich	458,505 458,453	
Paper box, •. H. Hicks. Paper hanging machine, Floring & Eisele. Paper rell holder, cutter, and prin ter. J. S. Ayde-	458,409 458,533 458,259	В
Pen wiper and paper weight, combined, H. K.	450,211	B C R R
Duke Pencil, litmus, J. S. Tyree Pianoforte action, T. Cahill. Pipe. See Tobacco pipe. Pipe coupling, T. W. Welsh. Pipes, device for thawing ice from, I. H. Simp-	458,244 458,219 458,542	S T
Planing and dressing machine, slat, J. A. Bald- win	458 399	
Planter, hand, W. Fisk. Planter, seed, J. W. Thompson. Platform. See Chimney platform. Plow fender. J. N. Bellinger.	458.214	В
Plow fender, J. N. Bellinger. Pocketbook, F. Lieker. Poison or fertilizer distributor, G. E. Kephart. Poke, animal, D. S. Morison. Fost. See Fence post.	458,214 458,235 458,232 458,476	BCCCCE
Power brake, electric, C. v. Greenamyer	458,24 9 458,257	Ĕ
Press. See Baling press. Printer's quoin, G. Milliken. Printer's rules, method of and machine for making W. B. Fish. Printing and adding machine, check, C. W. Weiss	458,42 6 458,531	F
Printing and adding machine, cbeck, C. W. Weiss Printing, folding, and cutting machine, web, W. Scott Pulley, self-oiling loose, A. D. Pentz	450 054	N N
Rail braces machine for making Partington &		F
Harden Rail fastener and chair for the same, F. F. Main. Rail joint, etc., J. Reife t. Railway chair, M. Geng. Railway chair, Sectional, J. N. Akarman. Railway chairs, preventing displacement in sectional, J. N. Akarman. Railway construction, J. L. Silsbee.	458,342 458,230 458,209	F
Railway gate, automatic, E. A. Chapel	458,267	. E
Railway sheaves, ball bearing for cable, C. A. BurtonRailway signal, automatic, A. B. SnyderRake, A. Dunn	458,517 458,198 458,270	8
Railway sheaves, ball bearing for cable, C. A. Burton. Railway signal, automatic, A. B. Snyder. Rake, A. Dunn. Razor strop, rotary, G. H. Coursen. Refrigerator, T. S. Caldwell. Register. See Cash register. Hotair register. Regulater. See Windmill regulator. Ribon clasp, E. L. Tiede. Rolling horseshoe blanks, machine for, J. F. Rob- lison. Rotary bolt. H. H. Ring.	. 458,521 . 458,153	,
Ribbon clasp, E. L. Tiede	458,280 458,498	 -
Rubber, C.J. Bailey. Rubber, hand, I. M. Levy. Sad iron, J. J. Markley.	. 458,212 . 458,468 . 458,462	į
Sash holder, L. A. Fort. Saw cleaner, T. V. Elliott Saw guard, gin, W. S. Killingsworth. Saw handle. G. G. Kerr.	. 458,158 . 458,523 . 458,4 66 . 458,299	
Rotary bolt, H. H. Ring Rubber, C. J. Bailey Rubber, C. J. Bailey Rubber, hand, I. M. Levy Sad iron, J. J. Markley Sash bolder, L. A. Fort Saw cleaner, T. V. Elliott Saw guard, gin, W. S. Killingsworth Saw bandle, G. G. Kerr Saw set, T. Shepard Saw sharpening machine, M. J. Wheeler Saws, metal bandle for crosscut, L. Omstead Scale, weighing, C. C. Stuart. Scalper and grader, N. C. Westerfield	. 458,275 . 458,205 . 458,552 . 458,332	\
Scalper and grader, N. C. Westerfield	. 458,246	•

		-
458.157	Scourer. See Grain scourer. Scraper, wheeled road, A. Harpold	458.455
458,157 458,190 458,191	Secondary battery, O. Lugo	458,425
	cotton, Waldron & Sprout	458,435
458,326 458 234	Seed separator, flax, D. E. Loger	458,469
458,326 458,234 458,553 458,261 458,371	Scourer. See Grain scourer. Scraper, wheeled road, A. Harpold. Secondary battery, O. 1.120. Secondary battery, O. 1.120. Seed declinting machines, feeding mechanism for cotton, Waldron & Sprout. Seed separator, flax, D. B. 1.0ger. Seed separator. See Seed separator. Sewing machine, W. P. Greenlaw. Sewing machine, R. Todd. Sewing machine felling guide, Priester & Schutz. Sewing machine tuck creaser, W. A. Estaver. Shades, extension hanger for window, W. T. Estberg.	458,363
458,371	Sewing machine felling guide, Priester & Schutz.	458,428
458,495 458,328	Sewing machine tuck creaser, W. A. Estaver Shades, extension hanger for window, W. T. Est-	458,360
	berg	458,447 458,356
458,464	Shafts, vehicle, C. S. Beebe. Shells, manufacturing, R. A. Hadfield. Shingle, metallic, A. Bickelhoupt.	458.105
458,491 458,268 458,329	Shingle, metallic, A. Bickelhoupt	458,152 458,340
458,329	Shire and necktie, combined, S. Broom. Shoe bottom fillings, forming, S. H. Howland	458,266
458,345	Signal. See Railway signal.	
458,508 458,355	Slats, device for repairing broken, I. Z. Merriam Sleigh knee, C. O. Snippen Spindles for weaving shuttles, making, C. E. Sod-	458,319 458,294
458,355 458,415	Spindles for weaving shuttles, making, C. E. Sod-	458,507
100,110	erberg	
458,430 458,335	Spinning machines tension device for endless	458,431
458,335 458,365	erberg. Spinning and doubling machines, spindle and bobbin for W. R. Sidebottom. Spinning machines, tension device for endless bands of, A. C. Dakin Spoke tenons, machine for turning, J. M. Sher-	458,444
•	man	458,276
458,467	man Spoons. making, H. C. Hart Spray producing apparatus, S. H. Stott Square for rafter and stair work, W. H. Bast	458,168 458,433
458,385 458,197 458,324		
458,324	Stand. See Switch stand. Starching machine, Hurlburt & Benjamin Steam boiler, B. Brazelle Steam cylinder, Hinrichsi & Barker Steam kettle, T. Burkhard	458,272
458,318	Steam boiler, B. Brazelle	458,413 458,458
:	Steam kettle, T. Burkhard458298,	458,2 99
458,181		
\$66,51H	Submarine battery, movable, R. Macdonald	458,186 458,473
458,477 458,403	Stud, machine, B. Piers Submarine battery, movable, R. Macdonald Supporter. See Itarine supporter. Suspenders, device adapted for the attachment of, C. Dunham.	,
458,403 458,300 458,223	C. Dunham	458,544
458,300 458,223 458,390 458,543	Switch, Weir & Goldsmith	458,450 458,452
458,543	Syringe, F. A. Reichardt	458,253 458,457
458,440	Tag, clipping, F. W. Hayes	458,169
458,463	Telephone switch boards, spring jack commuta-	458,419
458,383 458,551 458,221	tor for, L. A. Berthon	458,258 458,310
458,221	Suspenders, device adapted for the attachment of, C. Dunkam. Switch, Weir & Goldsmith. Switch stand, N. O. Goldsmith. Syringe, F. A. Reichardt. Syringe, vaginal, L. E. Hendrickson. Tag, clipping, F. W. Hayes. Telephone, E. Noriega. Telephone switch boards, spring jack commutator for, L. A. Berthon. Thill coupling, E. Wilder. Thimble, G. O. Rogers. Thrashing machines, feeder and band cutter for, Calderwood & La Sueur. Tierces, barrels, etc., means for piling up, J. C. Boyle	455,499
	Calderwood & La Sueur	458,334
458,520	Boyle. Tile, roofing, E. C. Lindemann (r).	458.515
458,317 458,175	Tire for wheels, flexible, B. C. Foster	11,186 458,547
	Tire, officialistic, W. Heale	458,393 458,172
458,343 458,461 458,539	Tile, roofing, E. C. Lindemann (r). Tire for wheels, flexible, B. C. Foster. Tire, pre-matter, W. Heale. Tire shriver, J. T. Kaylor et al. Tobacco pipe, T. Anderson. Tool, pneumatic, D. Drawbaugh. Too, psinning pistol, I. N. Phipps Toy pistol, R. Frisble. Track cleaner, H. G. Brakensiek. Trap. See Animal trap. Mole trap. Tracking wheel, E. O. Donk. Trimmer, See Wick trimmer. Troiley wire support, J. H. Palmer.	458,149 458,291
4 x 389	Top spinning pistol, I. N. Phipps	458,483
458,376 458,376 458,279	Track cleaner, H. G. Brakensiek	458,215
458,279	Trap. See Animal trap. Mole trap. Traction wheel, E. O. Donk	458,290
458,242 458,354 458,341	Trimmer. See Wick trimmer. Trolley wire support, J. H. Palmer. Truck, aar, L. A. Thompson. Truck, motor, G. M. Brill. Trusk, T. J. Loughridge. Truss joint, C. Steiner. Tubular boller, borizontal, L. White, Jr., *t* al.* Typewriters, etc., cabinet for, W. J. Elsom. Typewriting machine, J. T. Davis. Typewriting machine, J. B. Hammont. Typewriting machine, J. B. Hammont. Typewriting machine, C. Spiro. Umbrella or shade holder, J. H. Johnson. Uterine supporter, electric, G. F. Mohn. Valve, automatically governed, L. N. Charles. Valve, out-off, J. B. Brand. Valve for automatically venting hot water heating radiators, C. E. Van Aulen. Valve-operating mechanism and thermostatic index and controlling device therefor, automatic, W. E. Eastman. Vehicle body brace, Hoeffler & Chapman.	458.427
458,341	Truck, car, L. A. Thompson	458,200
458,150	Truss, T. J. Loughridge	458,472
458,423 458,535 458,273 458,255	Tubular boiler, horizontal, L. White, Jr., et al	4.58,199 4.58,277
458,273 ! 458,255	Typewriting machine J. T. Davis	458,446
458,344	Typewriting machine. J. B. Hammond	458,260
458,314	Umbrella or shade holder, J. H. Johnson	458,301
	Uterine supporter, electric, G. F. Mohn	458,536 458,247
458,370 458,320	Valve, cut-off, J. B. Brand.	458,311
458,450 458,173	ing radiators, C. E. Van Auken	458,202
458,174 458,351	dex and controlling device therefor, auto-	
	matic, W. E. Eastman	458,226 458 305
458,225 458,263	Vehicle motor apparatus, R. J. Sheeby	458,274
458,225 458,263 458,303 458,347 458,233 458,448	wex and controlling device therefor, automatic, W. E. Eastman. Vehicle body brace, Hoeffler & Chapman. Vehicle motor apparatus, R. J. Sheehy. Vehicle, two-wheeled, J. F. Barrows. Vehicle wheel guard, H. F. Ganon. Vehicles, system of electrical propulsion for, W. S. Richards. Ventilator. See Fire chamber ventilator.	458,514 458,159
458,347 458,233	Vehicles, system of electrical propulsion for, W. S. Richards.	458 377
400,440	Ventilator. See Fire chamber ventilator.	450.170
458,381 458,361 458,352	Ventilator and dust arrester, A. •lsen	458,179 458,538 458,280 458,379 458,293
458,352	Wagon brake, J. B. Garrett	458,280 458,379
458,412 458,410 458,511	Washing machine, B. T. McChesney	458,293 458,546
458,511 458,462	S. Richards. Ventilator. See Fire chamber ventilator. Ventilator, I. A. Lovejoy. Ventilator and dust arrester, A. See Wagon brake, J. B. Garrett. Wagon jack, D. F. Spangler et al. Washing machine, B. T. McChesney Watchmaker's tool, J. Fisher. Watch, stem winding and setting, C. T. Higginbotham.	450.000
458,462 458,1 9 3	Watch, stop, F. Bourquin	458,366 458,348 458,460
458,194	botham	458,460
458,325 458,184	N. Jensen	458,459
458,184 458,529	G. P. C. & C. G. Rives	458,496
458,529 458,227 458,313	Waterproofing pulp and other fibrous articles,	450.504
458,453	Watches, seconds band device for stem setting, N. Jensen. Water, apparatus for automatically shutting off, G. P. C. & C. & Rives. Water wheel, turbine, E. T. Diden. Waterproofing pulp and other fibrous articles, composition for, F. E. Keyes. Welding, electric, H. Lemp. Wheel. See Fifth wheel. Metallic wheel. Traction wheel. Water wheel. Whitheree, J. & P. J. Gutzler. Wick trimmer, A. Withmar. Window, G. H. Couch.	458,554 458,176
458,400 458,554	tion wheel. Water wheel.	
458,229	whichetree, J. & P. J. Gutzler	4.58,182 458,454
458,438	Wick trimmer, A. Withmar. Windmill regulator, hydraulic, A. & C. A. Church	458,439 458,538
458,251 458,338	Window, G. H. Couch	458,222
458,438 458,251 458,338 458,391 458,185	Window, G. H. Couch Window, F. V. & M. A. Greene Wool washing machine, S. & F. G. Davis. Wrench, ●. L. & G. T. Dodge.	458,315
	wrench, ♥. L. & G. T. Dodge	458,337
458,505 458,453	-	
458,409 458,533	DESIGNS.	
400,000		

DESIGNS.

Brush or mirror back, etc., C. Wagenfohr	21,01
Cutter, J. L. Boatner	21.00
Razor handle, L. C. Fuller	21.01
Razor handle, M. C. Lefferts21,013 to	
Rug, E. H. Bennett	21.01
Spoon, etc., Merrill & Keith	21.01
Table cover. etc., T. Mein	21.01
Table cover, etc., A. Petzold	21.01
,	,0-

TRADE MARKS.

П		- 1
ł	Batteries, galvanic, Manhattan Electrical Supply	. !
П		20,082
1		20,036
	Candy, peculiar species of, G. F. Ordway	
	Canay, pecunar species of, G. F. Ordway	20,072
	Cements, builders', McLean & Company	20,010
	Condition powder, D. H. Hawks	20,072
	Cornmeal, Glover & Allen	20,071
	Electricity, devices and apparatuses for generat-	
	ing, controlling, measuring, or applying, Elec-	
	trical Supply Company	20,066
	Flour. J. L. Rodgers & Co	20,075
	Garments, men's and boys'. Whitehill & Cleve-	
	land	20.078
÷	land. Hats and caps, men's and children's, D. E. Loewe	
İ	& Co.	20,069
!		20,079
Ċ	Medicine, liquid throat, Norwich Pharmacal Com-	,0,
Ė	nany	20.083
i	pany. Porcelain water closets, basins, and bath wastes, McCambridge & Co. Reilway equipments certain articles of O & C.	20,000
	McCambridge & Co	20,070
	Railway equipments, certain articles of, Q. & C.	~0,010
	Company	20.084
	Company	20,004
	kidneys, etc., Healy & Bigelow	20.068
	Remedy, female, W. H. McClure	20,000
	Polt dairm and table and course and the Deadler	20,081
	Salt, dairy and table and coarse and fine, Bradley	00.00
٠	Salt Company	20,067
ı	Sait, table and dairy, narriepools sait and brine	00.00#
J	Company	20,087
Ш	Salt, table, curing, and dairy, Hartlepools' Saltand	00.000
۱	Brine Company	20,088
1	Steel enameled kitchen ware, Haberman Manu-	
1	facturing Company	20,077
	Whisky, R. Monarch	20,080
	Whisky, Shea, Bocqueraz & Co	20,076
	Windmills, rotary, Pech Manuiacturing Company.	20,085

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., 321. Broadway, New York.

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

Mdvertisements.

Inside Page, each insertion - - 75 cents a line Back Page, each insertion - - - \$1.00 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.

USE ADAMANT WALL PLASTER



It is Hard, Denne, and Adhesive. Does not check or crack. It is impervious to wind, water, and disease germs. It dries in a few hours. It can be applied in anykind of weather. It is in general use. Licenses granted for the mixing usue, and selling.

Address ADAMANT MFG. CO. 309 E. Genesce St., Syracuse, N. Y.



Food Lathe Swings 9x25 in. Screw Cat-ting Auto-matic Cress Feed, etc. LATHE Scoul Sawe, Condar Saws, Latins Fire Mortisers. Calaborate Macahery.

Seneca Falls Mfg. Co., 695 Water St., Seneca Falls, N. Y.

PROPOSAL.

U. Engineer Office, Wilmington, Del-Aug. 22, 1891.—Sealed proposals, in tripli-Aug. 22, 1891.—Sealed proposals, in triplicate, will be received at this office until 12 o'clock, noon, on September 21, 1891, and then opened, for the construction of a new ice pier, and the removal of ice pier "H," in New Castle Harbor, Delaware. The attention of bidders is invited to the Acts of Congress approved February 25, 1895, and February 23, 1887, vol. 23, page 332, and vol. 24, page 414, Statutes at Large. For all information apply to WM. F. SMITH, United States Agent.

SINTIETH GRAND NATIONAL INDUSTRIAL EXHIBITION

OF THE

American Institute of the City of New York. Will open September 38 and close November 28, 1831. Intending exhibitors must make early application to secure proper space and classification. For blanks and other information, address CHARLES WAGER HULL, General Superintendent, American Institute, 113 West 38th Street, New York City.



The Shimer Cutter Heads
45.000 SOLD.
To work Car Siding, Flooring ing and Ship Lap; to Mould Doors, Sash and Blinds. Cope Heads to match.
Sam' J. Shimer & Sons, Centre St., Milton, Pa.



JENKINS' UPRIGHT CUSHIONED

POWER HAMMER

Usors of this hammer sustain us in saying that it has no equal in all good working qualities. Posted reasters and a newlection, with period control. For particularly, I. & R. WISTER & CO. 257 St. 4th St., Philadolphia, Pa., U.S.A.

SCIENTIFIC AMERICAN SUPPLE-MENT. Any desired back number of the SCIENTIFIC AMERICAN SUPPLEMENT can be had at this office for 10 cents. Also to be had of newsdealers in all parts of the country.





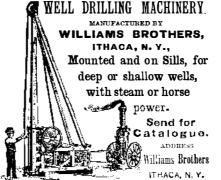
Don't any the classive vise when you can with E. C. Strange's Pat. Combination Vise and Drill have so many tools in one. For circulars and price, address, STRANGE'S MACHINE WORKS, Taunton, Mass.

Atkinson "Cycle" Gas Engine Atkinson "Cycle" das Engine
Useslessgasper H. P. than
any other.
Has a working stroke at every revolution of the crank. The steadiest, most economical, and
easiest to start of any gas
engine made.

Henry Warden, Manuf'r,
824 Allegneny Av., Phila., Pa.
Sizes from 2 to 50 H. E







"Improvement the order of the age."

THE SMITH PREMIER TYPEWRITER



Important Improvements.
All the Essential Features greatly perfected.
The Most Durable in Alignment.
Essential Tunning and Most Silent.
All type cleaned in 10 seconds without soiling the hands.

The Smith Premier Typewriter Co., Syracuse, N. Y., U. S. A. Send for Catalogue.

LEARN WATCHMAKING, etc., of W. F. A. Woodcock Winona, Minn. Write for terms and particulars.

STEEL TYPE FOR TYPEWRITERS



Steneils, Steel Stamps, Rubber and Metal Type Wheels, Dies, etc.
Model and Experimental Work Small Machinery, Novelties, etc. manufactured by special contract.
New York Stencil Wks., 100 Nassau St., N.Y



CONNECTICUT PEACH ORCHARD -By J. H. Hale. An interesting description of a farm on which 15.000 bushels of peaches are obtained from 35 acres. Contained in SCENTIFIC AMERICAN SUPPLEMENT, Nos. 759 and 7701. Price II centscach. To be had at this office and from all newsdealers.

Complete line for all uses shown in new Illustrated catalogue, free to all. Cushman Chuck Co., Hartford, Conn.



SPECIAL NOTICE!

Two handsome photo-engraved display sheets entitled,
"Recent Improvements in Air Compressors,"
"Recent Improvements in Rock Drills,"
mailed free to any one who will cut out this advertisement and mail it to us with his name

and address.
INGERSOLL-SERGEAN DRILL CO.
NO. 10 Park Place, New York, U. S.A.

INVENTIONS Practically DEVELOPED First-class workmanship only. Full interest and confidence guaranteed. Charges reasonable. Estimates furnished. WM. GRUNOW, Jr., 204 and 206 E. 43d St., N. Y.



\$3 PRINTING PRESS, printing. Save logue for two stamps. Kelsey & Co., Meriden, Conn.

The Sebastian-May Co. Improved Screw Cutting
Foot & LATHES
Power LATHES



Drill Presses, Chucks, Drills, Dors, and Machinists and Amateurs Outfits. Lathes on trial. Catalogues mailed on application. 165 to 167 Highland Ave., SIDNEY, OHIO.



WANTED. New or Second-hand Engraving Maddress 2315 South 10th Street, Philadelphia, Penna.



catalogue. Pierce Artesia: and Oil Well Sapply Co. 80 Beaver Street. New York.

The Scientific American PUBLICATIONS FOR 1891.

The prices of the different publications in the United States, Canada, and Mexico are as follows:

RATES BY MAIL. The Scientific American (weekly), one year The Scientific American Supplement (weekly), one
5.00 year,
The Scientific American, Spanish Edition (month-The Scientific American Architects and Builders Edition (monthly), one year, COMBINED RATES. The Scientific American and Supplement - - \$7.00
The Scientific American and Architects and Builders Edition, - - 5.00 The Scientific American, Supplement, and Archi-

tects and Builders Edition, - - - - 9.00

Proportionate Rates for Six Months.

This includes postage, which we pay. Remit by postal or express money order, or draft to order of MUNN & CO., 361 Broadway, New York.