Business and Personal

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

Order pattern letters & figures from the largest varie ty. H. W. Knight & Son, Seneca Falls, N.Y., drawer1115. "U. S." metal polish. Indiana polis. Samples free.

Kemp's Manure Spreader, Syracuse, N. Y. See Adv. Bankrupt Machinery Sales. Am. Tool W'ks, Clev., O. Chain Belting & Grain Dryers, F. H. C. Mey, Buffalo, N.Y.

Hoadley Portable Engines. Geo. T. McLauthlin & Co., 120 Fulton St., Boston, Mass Universal and Centrifugal Grindin Machines. Pedrick & Ayer, Philadelphia, Pa.

Handle turning machinery. Trevor Mfg. Co., Lock port, N. Y. Wm. Jesson & Sons have a handsome display of steel

in Mining building at the World's Fair.

Manufacturers who wish to manufacture a new style ax, address Frank X. Schnster. Raber, Mich.

The Improved Hydraulic Jacks, Punches, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York. Hydraulic Wheel Presses a specialty. The J. T. Schaffer Mfg. Co., Rochester, N. Y. See adv. page 399. Stow flexible shaft. Invented and manufactured by

Stow Mfg. Co., Binghamton, N. Y. See adv., page 30. Screw machines, milling machines, and drill presses. The Garvin Mach. Co., Laight and Canal Sts., New York.

Centrifugal Pumps for paper and pulp mills. I igating and sand pumpingplants. Irvin Van Wie, Syracuse, N. Y. Guild & Garrison, Brooklyn N. Y., manufacture steam pumps, vacuum pumps, vacuum apparatus, air pumps acid blowers, filter press pumps, etc.

Split Pulleys at Low prices, and of same strength and appearance as Whole Pulleys. Yocon Works, Drinker St., Philadelphia, Pa.

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

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 outfits complete, oil burners for solde ng, air pumps, can wipers, can testers, labeling machines. Presses and dies. Burt Mfg. Co., Rochester

Competent persons who desire agencies for a popular book, of ready sale, 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.



HINTS TO CORRESPONDENTS.

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.

or in this department, each must take his turn.

s colal 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.

(5176) W. H. B. writes: I have several pieces of steel in the form of horseshoes. How shall I proceed to magnetize them to get the best results? have access to dynamos, batteries, etc. How should steel be tempered for magnets? A. Heat the polar extremities of the horseshoe to a red heat. Harden them by cooling in water, draw the temper to a dark straw color verging on a purple, and if the poles of the field magnet of the dynamo are near enough together to allow the poles of the horseshoe to rest, one upon each of the dynamo poles, all that is necessary in order to magnetize your horseshoes is to place them in contact with the poles; but if the poles of the dynamo are too widely separated for this, you can apply one pole of the horse shoe to one pole of the field magnet and the other pole of the horseshoe to the other pole of the field magnet.

(5177) F. H. T. asks: 1. On page 407 of your Cyclopedia, No. 14 of hydro-developer, I find this receipt: Sulphite of sods, cryst. sods, and distilled water. Now what is meant by cryst. soda? A. Cryst. soda means crystallized sodium carbonate (washing soda). 2. I also notice in several places you say neutralize with different chemicals. I would like to know how the pross of neutralizing is done, i. c., to know when enough of the neutralizing chemical has been put in? A. To neutralize is to add acid or alkali to a solution as required until it is neither acid nor alkaline. Acid is added to neutralize an alkaline solution, and viceversa. Litmus paper may be used to determine neutrality. 8. How can I make litmus paper? I cannot buy it here, and how long will it keep? A. See page 371 of the Cyclopedia. Litmus paper will last a long time if kept out of strong

(5178) T. H. DeS. asks: 1. Will you kindly tell me how to make a spark coil? I am putting up in my bedroom an automatic electric gas burner and want spark coil for igniting gas. Kindly state of what the core should be made. A. No. 18; or No. 20 soft annealed iron wire. 2. Name diameter and length. A. % of an inch in diameter and 8 inches long. 8. What number (Am. w. gauge) of cotton-covered wire should the core be wound with? A. No. 18. 4. State the quantity of wire required for winding. A. Use enough of the magnet wire to make the depth of the winding about equal to the diameter of the core. This will probably require about 2 pounds.

any process by which copper can be melted in a crucible and poured in sand moulds, and then taken after they have become cold and heated to'a red heat in a forge and forged out on an anvil. I have tried to cast some soldering coppers and, upon forging them, they would all crack to pieces. I used best lake copper fluxed with about 1 per cent of aluminum, and casting without this flux they would become porous and unfit for use. A. There should be no difficulty in forging good copper. The aluminum tends to harden the copper and may be the cause of the difficulty in forging. Soldering coppers are usually forged from rolled copper rods. By making the castings of the proper shape, forging may not be needed. Try casting the coppers with 1 per cent of tin instead of aluminum.

(5180) W. H. R. asks: If you had a cell of battery giving say 10 amperes and 100 ampere hours working a motor, would it last longer if the motor had a resistance of 1 ohm or 8 ohms? A. By increasing the resistance of your motor, you would be able to run it for a longer time, though with less power.

(5181) E. E.—The latest observations concerning the newly descovered fifth satellite of Jupiter show that the little world is about 100 miles in diameter and 67,000 miles distant from the surface of its great king and father.

(5182) T. D. M. writes: We have a marble-topped sideboard on which some Horsford's acid phosphate has been spilled, turning the dark red stone a white color. Can you recommend something to restore the color? A. Try washing the stone with soda or some other alkali, stain with dragon's blood dissolved in benzine, and repolish. Your restoration will probably be

(5183) S. D. L., Jr.—The method of cutting down trees by means of electrically heated wire has proved a failure for the reason that the ashes accumulating in front of the wire prevent the wire from coming into contact with the wood.

(5184) W. H. C. asks: 1. Is a gravity ell suitable for running induction coil? A. No. Would iron (or steel) wire do for the secondary coil i A. No. 8. Does the primary coil or the electro-mag net induce the current? A. Both.

(5185) C. C. F. asks: About what deree of heat is produced when the gauge shows 60 pounds pressure of a boiler? I mean the dry steam. A. Steam at 60 pounds pressure has a temperature of 307° Fah.

(5186) G. L. F. writes: I have some wild plum trees that become badly infested with worms every summer. The worms spin a web which soon s the entire tree, spoiling leaves and fruit. Is there anything which will rid the trees of the worms and not injure the fruit for eating? Have tried a solution of sect powder, also slaked lime, without effect. A Reply by Professor C. V. Riley .- Without seeing speci. mens of the worms described it would be difficult to give a specific determination, but from the description the insect is evidently either one of the tent caterpillars (Clisiocampa spp.) or the common fail web worm (Hyphantria cunea). If the former, one of the best pre ventives is to cut off, during the winter time when the trees are bare, the egg masses which encircle the twigs and which are readily visible. At this time of the year, however, the best remedy will be to destroy the nestwhen it first appears, either by pruning it off and burning or by burning upon the tree by means of a mop saturated with coal tar and ignited, or a brick soaked in kerosene, fastened to a pole and ignited, which will answer admirably for this work. If this method is neglected until later in the season, when the nests have spread over larger branches, one of the quickest methods of treating a large number of trees or an orchard is to thoroughly spray with Paris green water in the proportion of a quarter of a pound of the poison to about 50 gallons of water. I have received many complaints the present year of the inefficacy of Paris green sprays, and have no doubt that in the great majority of instances this is due to an inferior article of Paris green, and every one using this arsenical should be careful to have the samples tested, so as to make sure that they are not so thoroughly adulter ated as to be practically useless.

(5187) A. W. P. writes: The writer, with others, in passing through Delaware and Raritan Canal recently, was led into a discussion as to the cause of the peculiar action of water on the banks. The swell from the boat rose about two feet above usual water level, and was preceded by a depression in the water of about the same, that is, the water at sides of canal from a point about opposite the bow of the boat sank down two feet, and was followed by the swell of two feet about opposite stern of boat. It is plain that the displacement would cause the swell, but what caused the water to sink two feet below the usual level? Was it the action of the propeller drawing the water back i If not, what? The boat was a small tug, 60 or 80 feet long. Canal 80 feet wide, speed 6 to 8 miles per hour. canals, by the inability of the water to move around the boat from bow to stern in the proper time corresponding with the speed of the boat; hence a wave is produced ahead of the boat and a corresponding depression at the side. This condition causes the water to flow backward past the boat with considerable velocity, meeting the wave following the boat and raising the crest that washes the banks. The propeller favors this action somewhat, but all boats when towing in a canal at considers. ble speed produce a bank wash by the retardation in the current to meet the displacement of the moving boat. Unless there is a depression from the how toward the stern, the water could not flow toward the stern, as it flows by gravity. The depression is the hydranlic gradient that produces the flow, and its velocity bears a relation to the speed of the boat and the relative sectional areas of the canal and boat. The same effect may be noticed with all vessels under speed in open waters, but the limited sectional area of a canal greatly increases the

(5188) F. C. writes: Please tell me through your paper whether you would advise me to use saw dust for a filling (between heavy siding and

(5179) H. K. asks: Can you tell me of | plaster) in place of paper and sheathing in oncer to cheapen the cost in building a house. A. We cannot under any circumstances advise the use of saw dust as filling in a dwelling. It cannot be put next the plaster until the plaster is set, which will be inconvenient in practice, and to put in a board lining behind the plaster would be expensive. There is also danger from a mass of sawdust in the walls of a building. Accidental wetting of the sawdust makes it liable to heat, and sponta neous combustion has often taken place in moist saw dust. Our advice is to use what has been the result of experience in wooden house construction, viz., close studding, diagonal sheathing with good stiff paper inside and outside the sheathing, and covered with clapboards, shingles or matched siding to suit the required style or taste. It will pay in the end in your climate.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

July 4, 1893,

AND EACH BEARING THAT DA	TERE	Dra Dre
[See note at end of list about copies of these pate	nts.]	Dre
Abdominal supporter, A. B. S. Phillips	500,609 1	Dri Dri Dri Du
Adding de vice and register, T. J. Lockwood	500,919 1 500,989 1 501,015 1	Dy Dy Eau
Advertising valise, Long & Dimick	501,013 1 501,016 500,910 1	Car Cd
Abdominal supporter, A. B. S. Phillips	501,046 1 500,877 1	Ele Ele
Ammonium nitratemaking, J. Landin	500,914 1 500,968 500,549 1	Ele Ele
Apparel fastener, wearing, T. Heintz. Armature, ring, C. W. Jefferson. Awning frame H. Glossenblor	500,890 1 500,893 1 500,902 1 500,741 1	Ele Ele Ele
Ammonium nitratemaking, J. Landin. Aulmas book, L. H. Smalley. Antheptic compound, I. H. Backeland. Apartment ventilator, J. Fransmann. Apparel fastener, wearing, T. Heintz. Armature, ring, C. W. Jeferson. Awning frame, H. Glessenbler. Ballot boxes, canceling and register actuating device for, W. T. Butler. Band cutter and feeder, E. S. Wilhite (r). Bandarge, water, G. F. Ells. Bank notes or other currency, press for packing, W. F. Hees. Bar. See Metal bar. Basket, splint laundry, G. H. Carlson. Bath. See Turkish bath. Bath hush, device for heating water in, B. W. Felthousen.	500,850 1 11.349	En
Bandage, water, G. F. Ells. Bank notes or other currency, press for packing, W. F. Hess.	500,568 1 500,766	En En
Bar. See Metal bar. Basket, splint laundry, G. H. Carlson Bath. See Turkish bath.	500,991	En En
Bathtubs, device for heating water in, B. W. Felthousen	500,802 j	En Fe Fe
Battery. See Secondary battery. Secondary electric battery. Bed bottom, A. W. Day. Bed, sofa, P. F. Asker. Bedstead, J. J. Dugan. Bedstead, invalid, A. J. Goodwin. Bedl, E. D. Rockwell. Bending press, S. Swartz. Berry picker, C. C. Head. Bicycle, V. H. Nulle. Bit See Bridle bit.	500,865 1 600,792 1 600,967 1	Fe: Fe: Fe:
Bedstead, invalid, A.J. Goodwin	801,006 800,961 1 800,974 1	R41
		Fii Fii Fii Fii
Bicycle, V. H. Nulle. Bit. See Bridle bit. Blotting pad, J. C. Moginie	500,774	Flo Flu Fo
Boiler, B. J. Coller	500,855 1 500,814 500,777 1	Fra
Blottling pad, J. C. Moginie. Boat. See Loe boat. Boiler. B. J. Coller. Boiler. B. J. Coller. Boiler. C. R. Moore. Boiler furnace, steam, C. Rinck. Booler furnace, steam, C. Rinck. Boole cutting machine, J. E. Wilson. Bone cutting machine, J. E. Wilson. Boo ker pad, memorandum, G. W. Brown. Book binder, N. D. Wolfard. Bottle stopper attachment, ink, G. R. Weed. Bottle stopper attachment, ink, G. R. Weed. Briting, Apparatus, M. E. Donaily. Box. See Journal box. Braiding machine, A. Bayler. Brake. See Air brake. Car brake. Gun carriage brake. Pulley brake. Railway rail brake. Brick, device for protecting unburned, Schlegel & Mayer. Brid eg gate, Habertbur & Mandel. Bridges, apparatus for recording the flexure of, K. Parenthou. Bridle bit, W. C. Wittmann. Brush & Bayler.	500,887 1 600,966 1 500,786 800,292 1	Fu Fu
Bottle stopper attachment, ink, G. R. Weed Entities for proper attachment, ink, G. R. Weed Bottling apparatus M. E. Donally.	500,962 1 666,936 1	Fu Fu Ga
Box. See Journal box. Braiding machine, A. Bayler Brake. See Air brake. Car brake. Gun carriage	500,685	Ga Ga Ga
brake. Pulley brake. Railway rail brake. Hrick, device for protecting unburned, Schlegel	500,620	Ga Ga Ga
Bridge, draw. Turner & Warner. Brid e gate, Habertbur & Mandel. Bridges, apparatus for recording the flexure of,	500,664	Ga Ga
Bridle bit, W. C. Wittmann. Brush, S. Palmer.	500,831 600,719	Ga Ge Gla
Buckle, blanket, F. J. Herrick	500,894 6 500,764 500,808	Gi Gla
Burner. See Gas burner. Bust form, E. & A. Merle Button shanks and fasteners, machine for con-	500,926	Gr Gr Gr
Bridge, draw. Turner & Warner. Brid e gate, Habertbur & Mandel. Bridges, apparatus for recording the flavure of, R. Parenthou. Bridle bit, W. C. Wittmann. Brush & Palmer. Buckle, Derrick & Moore. Buckle, Derrick & Moore. Buckle, Derrick & Moore. Buckle, Dinnket, F. J. Herrick. Buckle, wire, C. R. Harris. Burner. See Gas burner. Butfon shanks and fasteners, machine for connecting, E. Christensen. Cable releasing device and crossing, A. Jeffreys. Cake machine, S. L. Hall. Camers. See Magazine camers. Can baseling machine, W. A. & F. M. Dunn. Car bolster, C. T. Weetlake. Car brake, J. T. Duff. Car coupling, F. Anderson. Car coupling, F. Anderson. Car coupling, Munton & Frazier. Car coupling, B. F. Sheldon. Car coupling, Munton & Frazier. Car coupling, B. F. Sheldon. Car coupling, J. L. Sowell. Car can loader, A. Dahl. Car unloader, C. Tangenberg. Carriage tody, L. Doyle. Carriage body, L. Doyle. Carriage body, L. Doyle. Carriage tody, L. Do	500,993 6 500,903 6 500,655 6	Gr Gr Gu
Can labeling machine, W. A. & F. M. Dunn Car bolster, C. T. Westlake	500,586 500,983 500,649	Gu Gu
Car brake, A. P. Massey Car brake, F. Roediger Car brakes, hand shaft for J. H. Surtin	501,017 6 500,952 6 501,031 1	Gu Gu Ha
Car coupling, F. Anderson Car coupling, C. Halpin Car coupling, Munton & Frazier	500,731 1 500,890 1 500,815 1	H8 H8 H8
Car coupling, B. F. Sheldon Car coupling, J. L. Sowell Car coupling, F. V aughan	500,624 500,624 500,981	Ha Ha
Car equalizing device, J. Gosney	500,555 1 600,573 1 601,030	Ha Ha Ha Ha
Car, hopper bottom, R. Blackstone,	500,846 1 500,712 1 500,924	Ha He He
Car un loader, A. Dahl. Cars in mines, handling coal, J. A. Anderson Carbon trimming machine, C. O. Bartlett	500,997 500,647 500,553	He He He
Carbureting apparatus, S. Marcus. Carpet sweeper, C. Tangenberg. Carriage body, L. Doyle.	500,772 500,976 500,740	Ho
Carriake top, M. D. Martin Carrier. See Package carrier. Water carrier. Cash carrier apparatus, H. M. Weaver	500,642 1	Ho
Cash carrier apparatus, S. W. Barr. Cash register H. W. Hoffbeimer. Casket top fastener, S. N. Hiser. Castner teath on teasy wheels chill mould for S.	600,898 500,577	Ho Ho Ice
E. Maxwell. Cattle guard, B. Wolhaupter. Celling, metallic, C. C. Moore.	500,591 500,730 500,595	Ice Ice In
Cement pipes, apparatus for the manufacture of repressed, C. Schnell. Centrifugal machine, Von Szczeniowski & Von	500.675	In In In
Pionthowski. Chains, means for propelling C. W. Hunt. Chair. See Folding chair. Railchair. Railway rail chair.	500,807	Ind Ind Iro
Chimney or smokestack, R. Savage	500,779	Ja Je
per. Chuck, nipple, L. M. Saunders. Churn, I. S. & W. O. Bunker. Churn, J. L. Cutter. Cigar glossing device, O. Stroberger. Cigar holder, J. Anderssen. Clamps, die for forming metallic, O. C. Rumsey. Clasp. See Veil clasp.	500,320 500,990 500,859	Jo Ke Kr
Cigar glossing device, O. Stroberger	500,823 500,791 500,618	La La La
Cleaner. See Veil clasp. Cleaner. See Track cleaner. Clock, geographical, A. G. Jourdan.	500,659	La La La
Clock scouring ma chine, J. W. Steelbrooke Clock striking mechanism, E. O. Caccialupi Clock winding mechanism D. Vanthiar	500,626 600,704 500,883	La La La
Clothes pin, H. C. Griffin. Clothes wringer, C. Wheeler, Jr. Coin receiver or tray, W. A. Rusk.	500,874 500,984 500,985	La La La
Clasp. See Veil clasp. Cleaner. See Track cleaner. Clock, geographicaj, A. G. Jourdan. Clock, ship's bell, J. S. Negus. Clock souring machine, J. W. Steelbrooke Clock striking mechanism. E. O. Caccialupi. Clock winding mechanism, D. Vauthler. Clothes pin, H. C. Griffin. Clothese wringer, C. Wheeler, Jr. Coin receiver or tray, W. A. Rusk. Coin registering receptacle, E. A. Jahncke. Coke oven regenerative, F. Westermann. Collar and necktle, combined shirt, B. Lowenberg.	500,769 500,684	Le Le Li:
Collar fastener, adjustable, J. V. Washburne	500,640	
Courier, 500 Water Cooler. Copy holder, N. G. Leelie	500,715 600,638 500,638	Li Li
Condenser, about & rections. Cooler. See Water cooler. Copy holder, N. G. Leelie. Corset stiftener, D. H. Warner. Cotton conveyers, mechanism for automatically operating the sit or cut-off values of pnet-matic seed, F. C. Gammons.	A00,A04	Lo

i	Cotton gin saw, W. M. Brown. Cotton, treating, H. Anthoni. Coupling. See Car coupling. Hame couplin.	500,560 500,732
l	Hose coupling. Thill coupling. Hame couplin . Hose coupling. Thill coupling. Cream separator, J. J. Berrigan. Creamer, centrifugal, J. J. Berrigan. Creamer, centrifugal, N. G. Williams. Crimping machine, W. E. Frost. Crushing machine, R. McCully	501,039 501,040
١	Creamer, centrifugal, N. G. Williams	501,040 500,787 501,044 500,598
	Cultivator, C. Aulsber Cultivator, D. E. Barton Cultivator, C. T. Eldred e Cultivator, wheel, E. A. Couch Currents method of and mean for proceedings.	500,842 500,702 600,873
	Cultivator, wheel, E. A. Couch. Currents, method of and means for producing al-	000,799
	Cut-out, safety, O. Offrell. Cutter. See Band cutter. Bolt, cutter. Weed	500,630 500,601
		<u>\$00,681</u>
	Cyanides and ammonia, method of and apparatus for producing, T. B. Fogarty. Cycle mud guard, C. E. Hadley. Cycle pedal, dust proof. A. Perkins Cycles, construction of, J. M. & W. Starley Dash, carriage, C. A. Behlen.	500,289 508,942 690,971 600,989
	Dash, carriage, C. A. Behlen. Dash, vehicle, C. A. Behlen. Desks, device for operating the slides or rests of, J. B. Pooley. Disinfecting device, H. L. Bennett. Disintegrator, M. W. Leonhardt. Display frame, W. O. Rogers. Display rack, C. Frankel. Display stand, M. Anthony. Doll heads, apparatus for moulding, Vallee & Schultz.	600,845
	Disinfecting device, H. L. Bennett	500,610 500,784 500,916
	Display frame, W. O. Rogers Display rack, C. Frankel. Display stand, M. Anthony	500,745 500,879 500,889
	Doll heads, apparatus for moulding, Vallee & Schultz. Door, gralu, J. Sheridan	500, 682 500,963
	Schultz. J. Sheridan Door, grain, J. Sheridan Door, grain, J. Sheridan Dough-mixing apparatus, S. L. Hall. Draft equalizer, G. Jones. Drapery hook and pin, F. S. McKenney. Draw-bar attachment, Walker & Bedford. Drawer slide and extension support. V. R. Har-	500,656 500,808 500,744 500,728
		600,675 600,828
ļ	vey. Dredging apparatus, J. Price, Jr. Dress shield, H. Moschcowitz. Dress stiffeners machine for making, I. D. War-	500,928
	Delos Soo I oppdes delos	500,636 500,646
	Drilling machine, multiple, D. E. & L. E. Whiton. Drilling machine, multiple, D. E. & L. E. Whiton. Driving wheel, G. D. Munsing. Dust, treating flue, M. W. Hes. Dye, red azo, Green & Lawson	500,969 500,590 500,762
	Dye, violet red, L. Lifschutz	
	of fine, J. Klieber Educational appliance, J. E. Von Tassel. Electric currents, meter for alternating pulsating	500,58 5 500, 524
	of fine, J. Klieber. Educational appliance, J. E. Von Tassel. Electric currents, meter for alternating pulsating or intermittent, T. Duncan. Electric ignitor, W. F. West. Electric machines, brush bolder for dynamo, H.	, 501,000 500,644
	Electric motor J MacHaffle	500,012
	Electric switch, G. E. Linton Electric switch, E. Thomson Elevator gate, Lagerquist & Nelson Elevator safety device, N. V. Fitts Emery wheel, J. R. & A. M. Carpenter	500,918 500,629 500,586 600,876
	Emery wheel, J. R. & A. M. Carpenter Engine. See Gas engine. Rotary engine. Steam engine.	500,561
	Engine reversing gear, Whitting ton & Fishering, Engine, combustion chamber for petroleum or hydrocarbon, Richardson & Norris. Engines, oil-supplying device for hydrocarbon, Engines, oil-supplying device for hydrocarbon,	500,985 500,674
	Engines, rock arm for horizontal, E. J. Armstong. Bivelope, J. M. Cutter. Feed roll, sectional, R. M. Gleason. Feed water regulator, C. H. Gersting. Fence post, J. B. Gowdy. Fence post, J. B. Gowdy. Fence post, C. H. Van Wagoner. Fertiliser distributer and grain drill, L. I. & J. M. Bodenhamer. File boner W. H. Albee.	500,840 500,996
	Feed water regulator, C. H. Gersting	501,004 600,571 500,688 500,635
	Fertilizer distributer and grain drill, L. I. & J. M. Bodenhamer. File, paper, W. H. Albee	500,557 500,837
	Filter and cooler, F. E. Cady	500,787 500,996
	Flood gate, H. H. Eatherton	500.870
	Folding chair, coin-freed, J. O. Tonkin	500,783
	Frame, See Awning frame. Display frame. Fire- place frame. Fruit picker, J. Swanburg. Fruel, artificial, M. Nirdlinger Furnace. See Boiler furnace. Heating furnace,	501,0 82 500,984
	Hot-air forpace. Furnace, J. T. Jenkins. Furnace, J. T. Jenkins. Furnace, gas burner for boiler, C. T. Sloan Gune A. M. Carbbe.	600, 30 5
i	Game, A. M. Grubbs. Garbae, disposing of city. H. B. Arnold.	600,888 501,087
•	Game, A. M. Grubbs. Garbage, disposing of city, H. B. Arnold Garment supporter, D. H. Warner. Gas burner, natural, W. G. Taylor. Gas burner, self-generating, H. F. Smith. Gas engine, F. Cordenons. Gas generator, J. Nolan. Gases, Annaratus for and process of obtaining	501,087 500,637 500,694 500,754 500,935
	Gas engine, F. Cordenons	500,754 500,935
	Gate. See Bridge gate. Flood gate. Elevator	500,650
	Ga e. W. K. Mills. Generator. See gas generator. Steam generator. Glass. See Opera, field, marine, and other glass. Gluss bottles. Finishing tool for, Sheldon &	500,593
	Gluss bottles. Finishing tool for, Sheldon & Lynn Glass decorating apparatus, J. Macher Grain binder, G. L. Phelms	500,980 501,014 500,788 500,608
;	Grain binder, C. Colahan	500,738 500,608 500,725 500,720
	Grain binder, G. L. Phelps. Grain drill, J. A. M. Tyler. Grain splitting machine, J. Winter Gravity helmet, J. F. Corker. Guard. See Cattle guard. Hatchway guard. Cycle mud guard. Penhoider guard.	500,720 500,686
	Guitais. Aujustable tall piece for, F. A. inger-	600 501
!	Gun. Breechloading, J. Rider	. 600,949 . 600,927 . 500,908
i	Hame coupling, A. A. Parsons. Hammer. Forging, A. Sperl. Hammock, J. Shinn	500,608 500,970 500,692 500,680
i	Hammer Forging, A. A. Parsons. Hammer, Forging, A. Sperl. Hammock, J. Shinn. Hand press, W. S. Kisinger. Harness, I. N. Darr. Harvestertension device, T. Sampson	500,000 500,863 501,012
i	Harvestertension device, T. Sampson	501,012 500,778 500,983 500,688
	Hat, I Shepard. Hat, coat, and umbrella rack, E. W. Trout. Hatchway guard, C. J. Reynolds. Hay or hog rack, W. H. Long. Hay stacker, O. C. Nilson. Heater. See Water heater. Heater Thus workers W. H. Moyons	500,963 500,629 500,721 500,920 500,599
	Heater. See Water heater. Heater flue register, W. H. Meyers. Heating apparatus, G. L. Shorev	. 601,019 . 500,688
	Heater See water heater. Heater flue register, W. H. Meyers Heating apparatus, G. L. Shorey Heating furnace, W. P. Winner. Heel, M. Murray. Holdback, G. C. Edmunds Hook. See Drapery hook. Whiffletree hook.	500,688 501,034 500,816 501,008
	Hook. See Drapery hook. Whiffletree hook. Lacing book. Hoop fast ening. Ba el or other. E. W. Wassall	500,844
	Lacing book, Hong fast ening. Ba el or other, E. W. Beazell. Horse blanket strap, A. P. Russell. Horseshoe, D. Gingold Horseshoe. Nailless. S. Pruden.	600,619 500,881 600,946
į	Horseshoe, D. Gingold. Horseshoe, Nailless, S. Pruden. Hose coupling. Electric, J. B. Strauss. Hot air furnace, C. C. Sofielss. Ice boat. Oar-propelled, G. H. Thacher. Ice machine, G. F. Knox. Ice shedder or shaver. T. Mabbett. Induction coil. Coin operated, W. R. Pope.	. 600,946 . 600,822 . 500,821 . 500,826
)	Ice machine, G. F. Knox. Ice shedder or shaver, T. Mabbett. Induction coil. Coin operated W. B. Pone	501,045 500,928 500,778
;	Injector, F. Brunbauer. Injector, J. W. Stanley Injector J. W. Stanley Injurind Equation F. C. Mayley	500,752 500,677
	Induction coil. Coin operated, W. R. Pope. Injector, F. Brunbauer. Injector, J. W. Stanley. Instand. Foundain, F. C. Mayloy. Insulating coupling, L. McCarthy. Insulator. Conduit railway, G. E. Noyes. Intersecting miter, M. Gates. Iron, See Sad iron. Soldering iron.	600,690 601,021 600,987 600,570
,	Iron. See Sad iron. Soldering iron. Jack. See Lifting jack. Wagon jack. Screw	
)	Jews. Jewel-setting machine, W. Rundquist Journal box, G. W. M. Bowen Keyhole guide, C. Taylor	500,954 500,794 500,977
	Knitting machine. Straight, W.T. Rowlett Lacing hook, W. B. H. Dowse	500,958 600,568
j	Lamp. Electric arc, R. M. Hunter	500,757 500,829
	Jewel-setting machine, W. Rundquist. Journal box, G. W. M. Bowen. Keyhole guide, C. Taylor. Knitting machine. Straight, W. T. Rowlett. Lacing hook, W. B. H. Dowse. Lamp. Central draught, F. Rhind. Lamp. Electric arc, R. M. Hunter. Lamp. Electric arc, W. A. Turbayne. Lamp. Electric incandescent, Burnett & Doane. Lamp globe. Incandescent, T. B. Atterbury. Lamp. Incandescent electric, W. E. Nickerson. Lamp. Incandescent electric, W. E. Nickerson. Last, W. Gordon.	500,672 500,672
ì	Last, W. Gordon Lasting machine, J. T. Avery	. 500,713 . 500,713 . 500,548
	Lathe. Metal turning, T. Coldwell Laundry drier, A. V. M. Sprague	500,722 500,758 500,625
	Lamp. Incandescent electric, W. E. Nickerson. Lamp. Incandescent electric, Nickerson & Cary. Last, W. Gordon Lasting machine, J. T. Avery. Lathe attachment, J. E. Richards. Lathe. Metal turning, T. Coldwell. Laundry drier, A. V. M. Sprague. Leather skiving machine, A. J. Allen. Leveler. Land, W. Falconer Lifting jack, Mahaffey & Haldeman. Lightning arrester, W. A. Turbayne. Lightning arrester, C. S. Van Nuis. Lindeum or oil floorcloths. Manufacturing, J. C. Lyon.	. 500,689 . 500,689
ļ	Lightning arrester, W. A. Turdayne. Lightning arrester, C.S. Van Nuis. Linoleum or oil floorcloths. Manufacturing, J. C. Lizon	600,796
į	Liquid goods. Receptacle for carrying, G. Pe-	600 777
•	Liquid storage vessels, device for removing sedi- ment from bottoms of, Harder & Fox. Lock, See Nut lock, Railway switch lock, Lock, G. E. Tyson,	500,741
ı	* LOUIS G. D. TY8011	. 003/4

46	Scientitic
Locomotive boiler, W. B. Mack	Stove. Gasoline or vapor, H. Ruppel 500,747 Stove. Oil, I. Block. 501,745 Stove. Oil heating, C. Brandt 500,751 Stovepipe fastener, E. W. Mohroff 500,657
Loom, D. Durkin	ing J. V. Svenson. 500,781 Strap. See Horseblanket strap. Street sprinkler, C.A. Clark 500,858
Luber piling machine, H. Daniels. 500,783 Marazine camera, E. E. Ellis. 500,107 Marnetic separators, device for and method of adjusting and equalizing themarnetic density	Street sprinkler, C. A. Clark Street sweeper brush, Jones & Gillies
adjusting and equalizing themagnetic density in the pole pieces of, C. Q. Payne	Telephone system, G. L. Anders. 50,585 Thill coupling, J. W. Hoddinott. 560,885 Thrasher and binder combined, A. L. Gill. 500,798 Ticket stamping and cutting machine, R. Busek. 501,797 Titles, Frame for illuminating, H. Haustein. 501,008
adjusting and equalizing themagnetic density in the pole pieces of, C. Q. Payne. 500, 606 Mail, holder for sending coins by. W. B. Coulter. 500, 802 Match bunching machine, E. H. Bisenhart. 500, 872 Matte from slag, apparatus for separating. Sheedy & Iles. 500, 621 Methanical movement, E. M. Kellogg. 500, 621 Mechanical movement, E. M. Kellogg. 500, 584 Medical appliance, electro, S. Herthington-Carthers. 500, 767 Medical purposes, machine for making tablets	Tinning machine, Norton & Hodgson 598,738 Tire. Pneumatic, R. W. Huss 50,658 Tire. Pneumatic, C. Pickel 598,344 Tire. Pneumatic, C. F. Warner 500,638
Medical purposes, machine for making tablets for J. J. Mitchell. 500,594 Metal har to be calked. W. Grant. 500,884 Metal working, J. H. Bassler. 501,038 Meter See Multiphase meter. 501,038 Milker, cow, C. F. Kastengren. 500,713 Mills, automatic feed regulator for, A. N. Wolf. 500,832 Miter. See Intersecting miter.	Williams 500,647 Tool. Combination, J. D. Barnett 500,551 Tool holder, F. E. Youngs 500,834 Toy, C. S. Edwards 500,567
Meter See Multiphase meter. Milker, cow, C. F. Kastengren	Toy bank, R. A. Breul 500,805 Toy vehicle, F. H. Harris 500,805 Track cleaner, G. W. Ruggles 501,028 Track sanding device, A. & E. C. Goldsmith 500,882 Traction wheel. A. G. Rose 500,819
Motors Bower from river currents, apparatus for obtaining, A. A. Rauboid	Truck. Hand, G. Lillie
Mowing machine cutter bars, mechanism for raising, G. H. Pratt	Tubing, Flexible metalic, W. H. K. Bowley. 500,847 Tubing, Steam gauke, C. A. G. Winther 500,850 Tubular frame construction. A. Perkins 500,911 Turkish bath. Chiffonier, A. J. Cross. 500,858
Nipples during threading, device for holding, J. H. Reilly 500,746 Nipples during threading, device for holding, F. W. Smith, Jr. 500,748	Type wheels. Die for making, F. Ecaubert
H. Reilly 500,746	Welch 500,948 Valve. Relief, A. L. Harrison. 50,681 Vesetable chopper, C. B. Trumble. 50,686 Vehtcle running gear, J. Urbanek 50,686 Vehtcle spring seat, J. A. Alexander 500,768
Bradley Optical illusion, H. E. Perry Ore oncentrater, J. H. McCoy Ore oncentrater, J. H. McCoy Ore or feed pulverizer, J. M. Jones. Ore separator, W. S. Lockhart. Ores, method of and apparatus for separating, C. Q. Payne Oxygen, making, Webb, Jr., & Rayner Oxygen, making, Webb, Jr., & Rayner S01,032 Package carrier, J. G. Parkinson Package carrier, J. G. Parkinson Oxygen, making, Webb, Jr., & Rayner S01,032 Package carrier, J. G. Parkinson Package carrier apparatus, W. H. Albach S01,032 Package for stuffing boxes, metallic, T. H. Holmes.	Vehicle wheel, M. Burgess. 500,708 Vehicles. Driving mechanism for road, A. C. Auces. 600,544 Vehiclasp, C. M. Day. 500,884 Vehiclasp, C. M. Day. 600,894
Q. Payne 500,604 Oxygen, making, Webb, Jr., & Rayner 500,604 Package carrier J. G. Parkinson 501,023 Package carrier apparatus, W. H. Albach 501,023	Velocipede. Ice, D. Smith
Packing for stuming boxes, metanic, T. H. Holmes	Wagon or cart. Read & Hager 500.812 Wall facing, D. F. Saum 501.029 Warp threads. Harness supporting and heddle eye selecting device for machines for draw-
Robinson & Chamberlain	ing in. L. P. Sherman
Paper twine, making, J. F. Steward. 500.627 Pegging machine, T. Gare. 500.851 Pen, fountain, W. A. Leary. 500.811 Pen, hog, B. M. Wilkinson. 500.820	chines for drawing in. L. P. Sherman. 500,966 Watch bow fastener, L. Platnauer 500,817 Water, Apparatus for sterliging, D. Grove. 500,763 Water carier. Highland, Northway & Hammond 500,986
Paper, machine for cross cutting and collating, Robinson & Chamberlain	in, L. P. Sherman 500,864 Warp threads . Thread selecting device for machines for drawing in. L. P. Sherman 500,866 Watch bow fastener, L. Platnauer 500,817 Water, Apparatus for sterilizing, D. Grove 500,763 Water carier. Highland, North way & Hammond 500,386 Water conductors to buildings. Device for attaching. O. Rosenquest 600,816 Water cooler, E. T. Green 501,007 Water cruet. Eucharistic, L. C. Baudet 500,843 Water heater, J. Winterflood 500,843 Water heater, Fireplace, A. Berghold 500,554 Waterpoof fabrics. Manufacturing, G. C. Mandeley 60,864
	Water heater. Fireplace, A. Berghold. 600,554 Waterpoof fabrics. Manufacturing, G. C. Mandleberg. 600,664 Washing machine, A. P. Anderson. 600,666 Wosther strip, M. Restford. 520,659
Pin. See Clothes pin. Pipe. See Supply and waste pipe. Piperrash, obtaining. W. Marckwald. 500.605 Planter. corn. C. S. K. Eessler. 500.908 Planter, otton, L. M. Rhodes. 501.626 Plow, T. W. Boyle. 500.750 Plow, T. H. Lancaster. 501.011 Plow, A. S. Seeley. 500.011 Pocketbook, J. S. Huey. 500.001 Pole, vehicle, J. H. Osborne. 500.602 Poet. See Fence post. 500.602	Waterpool hornes. Manufacturing, G. C. Man- dleberg
Plow, A. S. Seeley. 500.60 Pocketbook, J. S. Huey. 500.901 Pole, vehicle, J. H. ●sborne. 500.802 Post. See Fence post. 500.802	Traction wheel, Vehicle wheel. Wheel, F.G. Hockensmith 500,578 Wheel, H. E. Kuhner 506,913 Whiffletree hook, G.C. Edmunds 501,602 Whidfletrie hook, G.C. Edmunds 500,911 Windows, metallic setting for stained glass, G. B. Lee. 500,577
Power applying mechanism, G. W. and M. G. Gillette. 500.710 lette. 500.710 Power transmission, A. L. Ide. 500.579 Press. See Bending-press. Hand-press, Presspre-regulator, N. Curtis. 500.394 Printing annilme-phase, J. Brandwein. 500.735 Printing device. Chromatic, T. J. Turley .500.734 Sci. 750.770 Linton J. Linton J.	Windows, metalite setting for stained glass, G. B. Leg. Wood embissing machine, E. L. Davis. 500,388 Wood moulding machine, H. P. Anderson. 500,388 Wood mill wines here combined, J. Roueruson. 500,580 Windows mill wines
Printing device. Chromatic, T. J. Turley .500,784. 500,785 Printing folded fabrics, &c. Mechanism for, R. J. Linton	Yarn drying machine, Tymeson & Ducros 500,684
Linton	TRADE MARKS. Baking powder, W. F. McLaughlin
Rack_Se Display-rack. Hay or hog rack. Meatrack. Rail-chair, M. Maloney	Bitters, emulsions, cough mix tures, sarsaparilla, and remedy for rheumatis m. C. H. Smith. 23.314
Railway-rail brake, S. M. J. House 691 010	tablets, vaginal, J. A. Miller
Railway-rail chair. A. J. Moxham	Cigarettes and tobacco, National Cigarette and Tobacco Company. Collyrium employed as a remedy for the eyes, R. Hudnut
	Flour, wheat. Northwestern Consolidated Milling Company. 23,236 to 28,325 Flour, wheat. W. H. Stokes. 23,236 Hams and pork meat. Edward Heitzeberg Pack- ing and Provision Company. 23,232
E. Moore	Reading Hardware Company. 23,325 Herrings and sardines, Yzermans & Co. 23,238 Hot air and water heaters, Richardson & Boynton
regulator. Rheostat, E. Thompson	Company. 21,323 Insect exterminating compound, Watson, Erwin 21,323 & Co. 21,221 Ardand butter, substitute for, Armour & Co. 23,221 Matches, Oshkosh Match Works
Riveting-machine, J. B. Courtet. 500,755 Riveting-machine rau nge, E. Easton 500,896 Rotary engine, W. W. Andrews. 500,896 Rotary engine, W. W. Andrews. 500,876 Rade. H. Clayton 500,572 Saddle. Harness. J. H. Price 501,024 Sash-balance, R. R. Cowl 501,764 Sash-balance, J. H. Shirman 500,577 Sash-balance, J. H. Shirman 500,577 Sash-balance, J. H. Shirman 500,577 Sash-balance, J. Gerhardt 500,767 Saww. Work-guide for V. Stein 500,767 Seow. Dumping, R. A. Mullin 500,620 Seal, E. J. Brooke 501,442 Seal, J. L. Hayden 500,743 Seal, J. J. Hayden 500,743 Sealing bottles, jars, &c. Means for hermetically	Medicines and pills, liverand kidney, Lincoh Pill Company
Sash-balance, J. H. Gowi 500,787 Sash-balance, J. H. Shipman 500,987 Sash-boord fastener, L. Gerhardt 500,780 Saws. Work-guide for V. Stein 500,780 Scow. Dumping, R. A. Mullin 501,000	Oils, lubricating, Abbett Cylinder Oil Company. 23283 Perfumery, C. L. Cotton 23.285, 23,286 Perfumery, tollet soaps and cosmetics, Blondeau Pet Cie. 23,283 Perfumers, tollet soaps and cosmetics, Blondeau et Cie. 23,284 Panos, McCammon Piano Company. 23,382
S rew-jack, Cur & Fahey	Remedies for coughs and colds, H. H. Stoddard. 23,311 Remedies for gonorrhea, gleet, etc., Pease & Johnston. 23,317 Remedies for coughs, colds, catarrh, etc., sirup,
Seat. See Vehicle spring-seat. Secondary-battery, W. L. Silvey 500,622	M. P. Hahn. Remedy for kidney and liver complaints, Herbaline Medicine Co. Remedy for theumatism, G. A. Lehnau. Remedy for the tobacco habit, U. Stackhouse. Salve, M. P. Hahn. 23,812 23,339
Secondary electric battery, Thoryc & Oblasser 600.978 Seesaw and merry-ro-round. Combination, F. Goldsmith	TODACCO and cigarettes, plug or chewing, twist,
Shirt and collar therefor, B. Lowenberg. 500,928 Shoe, B. R. Tilligren. 500,681 Sleve. Separator, C. Kind. 500,781 Signaling system. W. E. Decrow. 500,563 Sirup-di pensing apparatus, H. Hoff. 500,883 Soap. 504, D. Allen. 501,032 Boldering-iron and heater. Ricctric, A. Tinuer-holm. 500,803	DESIGNS.
Sorting materials according to size. Machine for	Bracket, E. C. Hiscock
W. S. Lockhart	Cigar head former, C. Hysses
Spinning and doubling spindle, Crabtree & Gillow 600,855 Spinning-machine attachment, L. Croes et al. 500,755 Spinning-ring, G. O. Draper. 500,505 Spout for metallic vessels. Separable, C. I. Mc- Laughlim. 600,985 Spring support. Elliptic, W. S. Noyes. 600,600	Gimp, C. Weinberg. 22.578 Glass v casel, J. J. O'Compor. 22.588 Monument, W. H. Perry. 22.538 Rog. A. Petsold 22.578
Sprinkler. See Street-sprinkler. Square. T. A. Walentowitz	Sign, C. W. Spalding 22,583, 22,584 Stove, oil, J. Keils 22,592
Spout for metallic vessels. Separable, C. I. Mo- Laughlin. 500,983 Spring support. Filliptic, W. S. Noyes. 500,603 Sprinkler. See Street-sprinkler. 500,723 Stand. See Display-stand. Stapling-machine, G. Hay. 500,573 Standen See Display-stand. 500,573 Stave-dressing machine. D. F. Miller. 500,573 Steam-boiler, F. M. Ashley. 500,733 Steam engine, R. D. Werden. 500,733 Steam generator, Finlayson & Popkins. 500,603 Steam generator and smelting furnace, J. L. Gl- Froux. 500,503	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 20 cents. In ordering please state the name and numb of the patent desired, and remit to Munn & Co., 361
Eteel hardening apparatus, E. Tweedy 500,578 Stocking and knitting rame, J. H. Woodward 50,778 Stone saw, D. C. Miller 500,668 Store service apparatus, H. M. Wesver 500,641	of the patent desired, and remit to Munn & Co., 361 Broadway, New York. Canadian patents may now be obtained by the inventions named in the fore- going list, provided they arc simple, at a cost of \$40 each, if complicated the cost will be a little more. For full instructions address Munn & Co., 861 Rroadway, New York. Other foreign patents may also be obtained.
Stove, P. Frank 500,67 Stove, Alcohol, J. Heller 501,72 Stove, Cooking, T. Faller 501,72	if complicated the cost will be a little more. For full instructions address Munn & Co., MI Broadway, New York. Other furnish patents may also be obtained.

	Scientific
Ī	Stove. Gasoline or vapor, H. Ruppel
	Stove. Qasoline or vapor, H. Ruppel. 500,745 Stove. Oil, I. Block. 500,751 Stoveple fastener, E. W. Mohroff. 500,657 Stoveple fastener, E. W. Mohroff. 500,667 Stoves or soldering apparatus. Burner for cooking, J. V. Svenson. 500,678 Strap. See Horseblanket strap. 500,908 Street sprinkler, C. A. Clark. 600,858 Street sweeper brush, Jones & Gillies. 500,908 Supply and wastep ipe, W. A., Eberh 500,810 Switch, See Electric switch. 500,810 Switch leee and making it. A. J. Moxham. 500,300
	Stoves or soldering apparatus. Burner for cooking J V Svenson
	Strap. See Horseblanket strap. Street sprinkler, C. A. Clark
ļ	Street sweeper brush, Jones & Gillies
1	Table. See Railway transfer table. 500,545 Telephone system, G. L. Anders. 500,505 Thill coupling, J. W. Hoddinott. 500,706 Thrasher and binder combined, A. L. Gill. 500,706 Tickes tramping and cutting machine, R. Busek. 501,707 Tiles. Frame for illuminating, H. Haustein. 501,008 Tinning machine, Norton & Hodgson. 580,738 Tire. Pneumatic, R. W. Huss. 500,638 Tire. Pneumatic, G. Pickel. 500,638 Tobacco stripping and booking machine, J. R. Williams. 500,647 500,647
	Thrasher and binder combined, A. L. Gill
ļ	Tiles. Frame for illuminating, H. Haustein
1	Tire. Pneumatic, R. W. Huss. 500,638 Tire. Pneumatic, G. F. Warner 500,638
l	Tobacco stripping and booking machine, J. R. Williams
١	Tool. Combination, J. D. Barnett
l	Toy, C. S. Edwards
١	Track cleaner, G. W. Ruggles
ļ	Traction wheel, A. G. Rose
1	Tobacco stripping and booking machine, J. R. Williams 500.647
-	Krammer. 560,312 Truss, W. Danz. 500,738
1	Tubing. Flexible metallic, W. H. K. Bowley 500,847 Tubing. Steam gauke. C. A. G. Winther 500,830
١	Tubular frame construction. A. Perkins
	Type wheels. Die for making, F. Ecaubert
-	Valve. Automatic relief, W. P. West
1	Valve operating device for gas heaters, A. T. Welch 500,948 Valve. Relief, A. L. Harrison 50,956 Vestable chopper, C. B. Trumble 50,956 Vehicle running gear, J. Urbanek 50,956 Vehicle spring sest, J. A. Alexander 50,758 Vehicle wheel M. Rurgess 50,778
	Vesetable chopper, C. B. Trumble 50,586 Vehtcle running gear, J. Urbanek 50,086 Vehtcle spring seat, J. A. Alexander 50,798 Vehicle spring seat, J. A. Alexander 50,798 Vehicle wheel, M. Burgess 50,708
	Vahicles Driving machanism for road. A. C.
	Ames. 600,544 Veil clasp, C. M. Day. 500,884
ij	Toto of pour in the institution
3	Veterinary operating table, W. J. Magee
	Wagon jack, Z. L. Paimer 500,940 Wagon or cart, Read & Hager 600,612
·	Wall facing, D. F. Saum. 501,629 Warp threads. Harness supporting and heddle
1	Velocipede. Ice, D. Smith. 600.633 Ventilator. See Apartment ventilator. Veterinary operating table, W. J. Magee. 500.583 Vote counting apparatus, E. G. Richards. 500.548 Wagon jack, Z. L. Paimer. 500.940 Wagon or cart. Read & Hager. 500.612 Wall facing, D. F. Saum. 500.612 Wall facing, D. F. Saum. 500.612 Warp threads. Harness supporting and heddle eye selecting device for machines for drawing in L. P. Sherman. 500.965 Warp threads. Needle operating and reed dent separating device for machines for drawing in the separating device for machines for drawing for the separating device for machines for drawing for the separating device for machines for drawing fo
١	Warp threads. Needle operating and reed dent separating device for machines for drawing in, L. P. Sherman
	Warp threads. Thread selecting device for ma- chines for drawing in. L. P. Sherman 500,966
	Watch bow fastener, L. Platnauer 500.817 Water. Apparatus for sterilizing, D. Grove 500.763
	Water carier. Highland, Northway & Hammond 500,986 Water conductors to buildings. Device for at-
	Water cooler, E. T. Green 501.007 Water cruet. Eucharistic, L. C. Raudet, 500.848
	taching, O. Rosenquest. 500,816 Water cooler, E. T. Green. 511,007 Water cruet. Eucharistic, L. C. Baudet. 500,848 Water heater. J. Winterflood 500,878 Water heater. Fireplace, A. Berghold. 500,551 Waterpoof fabrics. Manufacturing, G. C. Man- dleberg. 500,867
3	Waterpoof fabrics. Manufacturing, G. C. Man- dleberg
,	Weather strip, M. Bractford. 500,559 Weather strip, H. C. S'uller shows
9	Weather strip, Green & Wesselowski. 500.83 Weed cutter, etc., W. A. McCoy. 500.982
	Welding machine, electric, M. M. Suppes
1	Wheel F. C. Hockensmith 500,578
\$	Whiffletree hook, G. C. Edmunds 501,602 Windmill, W. Kouns
9	Water heater. Fireplace, A. Berghold. 500,554 Waterporf fabrics. Manufacturing, G. C. Man- Golder & Manufacturing, G. C. Manufacturing, G. C. Manufacturing, Sol. 559 Wasther strip, Green & Wesselowski. 500,558 Wasther strip, Green & Wesselowski. 500,558 Wonding machine, Glectric M. M. Suppes. 500,978 Wheel. See Driving wheel. Emery wheel. Traction wheel, Vehicle wheel. Wheel, F. G. Hockensunth 500,578 Wheel, H. E. Kuhner. 500,938 Whitmill, W. Kouns. 500,938 Windows, metalite setting for stained glass, G. B. Lee. 500,557
ķ	Leas, metalle setting for statute glass, 50.557 Wood embossing machine, S. L. Davis. 500,598 Wood moulding machine, H. P. Anderson. 500,799 Wrenen and wises litter temporals, J. Kouerusen. 500,500 Wringer. See Clothes wringer. Yarn drying machine, Tymeson & Ducros. 500,684
5	Wringer. See Clothes wringer. Yarn drying machine. Tymeson & Duoros
0	WOLUB 000,000
8	TRADE MARKS.
5	Baking powder, W. F. McLaughlin
-	i deel, lager, liend & Gadier Brewing Company 21.30

DESIGNS.

Rilliard table. P. Auganbraum	22,594
Bottle stopper, J. Cave	22.6B2
Bracket, E. C. Hiscock	22,686
Cabinet, M. J. Cantwell	22,668
Cigar head former. C. H vasa.	22,695
	22,650
Counter wall fixture, W. C. Huss	22.591
Cup. W. A. Brown	22,580
Basel, V. Adlar. Gimp, C. Weinberg	21,587 21,579
Glass v essel, I. J. O'Connor.	22,581
Monument, W. H. Perry	22,5.3
Rug. A. Petrold	22.578
Ruler, P. COX	22.584
Sign, C. W. Spalding	22,595
Stove, oil, J. Keils	22,552

Mdvertisements.

ORDINARY RATES.

Inside Page. each insertion - - 75 cents a line Back Page. each insertion - - - \$1.00 a line For some classes of Advertisements, Special and Higher rates are required.

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.

Patent Foot Power Machinery
Outfits.

Wood or Metal workers without steam power can successfully compete with the large ships, by using our New LAHOH SAVING Mackinery, latest and most improved for Practical Shop Use, also for Industrial Schools, Home Training, etc. Catalogue free. Seneca Falls Mfg. Co.



IMPROVED LATHES MODERN DESIGNS Also Foot Lathes, Tools and Supplies. Catalogue Free Sehastian Lathe Co. 120-122 Culvert Airest Cincinnati, dillio.

New Full Mounted Lightning Screw Plate, Send for Catalogue.



Wiley & Russell Mfg. Co., Greenfield, Mass., U.S.A.

Rubber Rolls and Wheels.

er Wringing Machines, Drying and Ventilating All styles of Trucks made to order. Catalogues GEORGE P. CLABK, Box I., Windsor Locks, Conn.



MASON & HAMLIN SCREW STRINGER

One of the greatest improvements in the history of the Piano Forte. Keeps the Piano in Tune.

Much More Durable.

Quality of Tone Purer.

Fully Illustrated Catalogue sent on

application.

deplication.

Mason & Hamlin Organ & Piano Co.

152 TREMONT St., BOSTON, MASS.

ICE-HOUSE AND COLD ROOM.—BY R. G. Hatfield. With directions for construction. Four engravings. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, NO. 511. Price 16 cents. To be had at this office and from all newsdealers.

GRAVER TANK WORKS,



(INCORPORATED.) Manufacturers of Iron and Steel STORAGE TANKS.

OFFICE. 3d Floor, Rookery Bidg. CHICAGO, ILL.

E. Konigslow, manufacturer of Fine Machinery and Models, offers Special Fucilities to Inventors. Guarantees to work out ideas in strictest secrecy, and any improvement that he can suggest goes with the work. Thousands of men have crude though really valuable ideas, which they lack mechanical training to develop. Novelties and patented articles manufactured by contract. 181 Seneca St., Cleveland. Ohio.



PRESS, \$3
Larger size, for circulars, 48.
Small newspaper press, \$44.
Money saver or money making business. Full printed instructions. Send stamp for per, etc. KELSEY & CO., Mirs., Merider, Conu.

THOMPSON IMPROVED INDICATOR



Manufactured solely by American Steam Gauge Co. 5,000 IN USE. Adopted by the U.S. Navy on all the government cruis s and gunbosts to be built.

> Also Manufacturers of POP SAFETY

STEAM PRESSURE GAUGES, ETC. 34 Chardon Street, Boston, Mass.

SMOKELESS POWDER AND MAGAthe Rifles.—By I. G. Duff Grapt. An interesting paper on the various amokeless powders for military purposes now in existence, and the weapons mostly used therewith. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 592 and 593. Price if cents each. To be bad at this office and from all newsdealers.



LIFE SAVING DEVICES .- A COLlection of suggestions of devices for communicating between the shore and stranded vessels, offered to the London Budy Graphic by various correspondents. With 100 illustrations tweeth the shore and stronger coasets, onered to the London Dady Graphic by various correspondents. With 100 illustrations. Contained in Scientific American Scipplement, Nos. 848, 854, 859, 851, 862, 864, 869, 871, 874 and 884. Price 10 cents each, or \$120 for the series. To be had at this office and from all newsdealers.



The McCONNELL Germ Proof Filters

REMOVE MICROBES

-AND-All Kinds of Disease Germs. Is a Filter and Cooler Combined. The ice as it melts is filtered.

> No other gravity filter does this. The McConnell Filter Co.

BUFFALO, N. Y.

THE



EF ESTABLISHED 1845.

The Most Popular Scientific Paper in the World Only \$3.00 a Year, Including Postage. Weekly-52 Numbers a Year.

This widely circulated and splendidly illustrated paper is published weekly. Every number contains sixteen pages of useful information and a large number of original engravings of new inventions and discoveries. representing Engineering Works, Steam Machinery, New Inventions, Novelties in Mechanics, Manufactures, Chemistry, Electricity Telegraphy, Photography, Architecture, Agriculture, Horticulture, Natural History, etc. Complete list of patents each week.

Terms of Subscription.—One copy of the SCIEN-TIFIC AMERICAN will be sent for one year—52 numbers— postage prepaid, to any subscriber in the United States, Canada, or Mexico, on receipt of three dollars by the publishers; six months, \$1.50; three months, \$1.00.

Clubs.-Spe ial rates for several names, and to Post dasters. Write for particulars.

The safest way to remit is by Postal Order, Draft, or Express Money Order. Money carefully placed inside of envelopes, securely sealed, and correctly addressed, seldom goes astray, but is at the sender's risk. Address

etters and make all orders, drafts, etc., payable to
MUNN & CO., 361 Broadway, New York.

Scientific American Supplement

This is a separate and distinct publication from THE SCIENTIFIC AMERICAN, but is uniform therewith in siz, every number containing sixteen large pages full of engravings, many of which are taken from foreign papers and accompanied with translated descriptions. SCIENTIFIC AMERICAN SUPPLEMENT is published week ly, and includes a very wide range of contents. It presents the most recent papers by eminent writers in all the principal departments of Science and the Useful Arts, embracing Biology, Geology, Mineralogy, Natural History, Geography, Archæology, Astronomy Chemis-try, Electricity, Light, Heat, Mechanical Engineering, Steam and Railway Engineering, Mining, Ship Building, Marine Engineering, Photography, Technology, Manufacturing Industries, Sanitary Engineering, Agriculture, Horticulture, Domestic Economy, Biography, Medicine, etc. A vast amount of freah and valuable information obtainable in no other publication.

The most important Engineering Works, Mechanisms, and Manufactures at home and abroad are illustrated and described in the SUPPLEMENT.

Price for the Supplement for the United States, Canada, and Mexico, \$5.00 a year; or one copy of the SCIENTIFIC AMERICAN and one copy of the SUPPLE-MENT, both mailed for one year to one address for \$7.00. Single copies, 10 cents. Address and remit by postal order, express money order, or check, MUNN & CO., 361 Broadway, New York,

Building Edition.

THE SCIENTIFIC AMERICAN ARCHITECTS' AND BUILDERS' EDITION is issued monthly. \$2.50 a year. Single copies, 25 cents. Thirty-two large quarto pages, forming a large and splendid Magazine of Architecture, richly adorned with elegant plates in colors, and with other fine engravings; illustrating the most interestin examples of modern architectural construction and

A special feature is the presentation in each number of a variety of the latest and best plans for private resilences, city and country including those of very moderate cost as well as the more expensive. Drawings in erspective and in color are given, together with Plans, criptions, Locations, Estimated Cost, etc.

The elegance and chear ness of this magnificent work have won for it the Largest Circulation of any Architectural publication in the world. Sold by all newsdealers. \$2.50 a year. Remit to

MUNN & CO. Publishers, 361 Broadway, New York.



NEW CAMERA

Fitted with all improvements for hand or tripod work, including EXCEEDINGLY COMPACT.

It is the ideal Camera for Tourists, Bicyclists, Canoeists, and all others to whom a saving in space is an important consideration. Full particulars in our new catalogue-mailed free.

ROCHESTER OPTICAL CO. 14 Se. Weter St., ROCHESTER, N. Y.