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 oppear in next issue.

Betancourt's Rotary Plow, illustrated on page 146, is for sale. See notice for address.

Use King's Office Pen, patented July 31, 1883. rior to all others. Price, \$1 per gross, mailed free of postage. One dozen pens sent as samples on receipt of 10 cents. Geo. F. King & Merrill, 29 Hawley Street, Boston, Mass.

New scientific books on Steam, the Steam Engine, Mechanics, and Engineering. Send for catalogues before purchasing. F. Keppy, Publisher, Bridgeport, Conn.

Steam Pipe and Boiler Covering, Roofing Paints, Prepared Roofing, and general line of Asbestos materials. Phil Carey & Co., 127 Central Avenue, Cincinnati, O.

'Telescope. 14" diam., \$450. T., 835 Linden St., Cam-

Wanted.—Partner for the manufacture of four useful articles from sheet metal. Also for sale, or on royalty. Address L. B. 456, Jamaica (L. I.), N. Y.

For Sale.—Steel Fig's., \$1. S. M. York, Cleveland, O. Lightning Screw Plates, Labor-saving Tools, p. 140.

Microscopes, Microscopic Mounting Instruments, and hardware in the country. Materials. Send for catalogue. Queen & Co., Phila. 25" Lathes of the best design. Calvin Carr's Cornice Machinery. G. A. Ohl & Co., East Newark, N. J.

Brush Electric Arc Lights and Storage Batteries. Twenty thousand Arc Lights already sold. Our largest machine gives 65 Arc Lights with 35 horse power. Our Storage Battery is the only practical one in the market. Brush Electric Co., Cleveland, O.

Best Squaring Shears, Tinners', and Canners' Tools at Ningara Stamping and Tool Company, Buffalo, N. Y. Lathes 14 in. swing, with and without back gears and screw. J. Birkenhead, Mansfield, Mass.

The Best.-The Dueber Watch Case.

If an invention has not been patented in the United States for more than one year, it may still be patented in Canada. Cost for Canadian patent, \$40. Various other foreign patents may also be obtained. For instructions Munn & Co., Scientific American Patent Agency, 261 Broadway, New York.

for rubber and leather belts. Greene, Tweed & Co., N.Y Guild & Garrison's Steam Pump Works, Brooklyn, N. Y. Steam Pumping Machinery of every description. Send for catalogue.

Nickel Plating .- Sole manufacturers cast nickel anplete outfit for plating, etc. Hanson & Van Winkle, Newark, N. J., and 92 and 94 Liberty St., New York.

Lists 29, 30 & 31, describing 4,000 new and 2d-hand Machines, ready for distribution. State just what machines wanted. Forsaith & Co., Manchester, N. H., & N. Y. city.

For Power & Economy, Alcott's Turbine, Mt. Holly, N. J. "Abbe" Bolt Forging Machines and "Palmer" Power

Hammers a specialty. Forsaith & Co., Manchester, N.H. Right and A spirit manufacture company property Send for Monthly Machinery List to the George Place Machinery Company.

121 Chambers and 103 Reade Streets, New York. "How to Keep Boilers Clean." Book sent free hy

James F. Hotchkiss, 84 John St., New York. Wanted .- Patented articles or machinery to make

and introduce. Gaynor & Fitzgerald, New Haven. Conn Water purified for all purposes, from household sup-

plies to those of largest cities, by the improved filters manufactured by the Newark Filtering Co., 177 Commerce St.. Newark, N. J. Latest Improved Diamond Drills. Send for circular

to M. C. Bullock Mfg. Co., 80 to 88 Market St., Chicago, Ill. Ice Making Machines and Machines for Cooling Breweries, etc. Pictet Artificial Ice Co. (Limited), 142 Greenwich Street. P.O. Box 3083, New York city.

Spy Glasses, Telescopes, Opera Glasses, Field Glass Send for catalogue. Queen & Co., Philadelphia,

Presses & Dies. Ferracute Mach. Co., Pridgeton, N. J Machinery for Light Manufacturing, on hand and built to order. E. E. Garvin & Co., 139 Center St., N. Y.

Split Polleys at low prices, and of same strength and appearance as Whole Pulleys. Yocom & Son's Shafting Works. Drinker St., Philadelphia. Pa.

Supplement Catalogue.-Persons in pursuit of information on any special engineering, mechanical or scientific subject, can have catalogue of contents of the Scientific American Supplement sent to them free The SUPPLAMENT contains lengthy articles embracing the whole range of engineering, mechanics, and physical science. Address Munn & Co . Publishers, New York.

Improved Skinner Portable Engines. Erie. Pa.

Steam Pumps. See adv. Smith, Vaile & Co., p. 93. Drop Forgings. Billings & Spencer Co. Seeadv., p. 109.

Fossil Meal Composition, the leading non-conducting covering for boilers, pipes, etc. See adv., p. 158.

The Sweetland Chuck. See illus. adv., p. 110

Catalogues free.-Scientific Books, 100 pages; Electri-Hollar's Safe and Lock Co., York, Pa., manufacturers of improved Fire and Burglar-proof Safes. Bank and

Fire Brick, Tile, and Clay Retorts, all shapes. Borgner & O'Brien, M'f'rs, 23d St., above Race, Phila., Pa.

Peck's Patent Drop Press, See adv. page 141.

Safe Deposit Vaults and Locks. See adv. p. 126.

Curtis Pressure Regulator and Steam Trap. See p.142. Diamond Planers. J. Dickinson, 64 Nassau St., N. Y.

Steam Hammers, Improved Hydraulic Jacks, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York. 50,000 Emerson's Hand Book of Saws. New Edition.

Free. Address Emerson, Smith & Co., Beaver Falls, Pa. For Pat. Safety Elevators, Hoisting Engines. Friction Clutch Pulleys, Cut-off Coupling, see Frisbie's ad. p. 140. Gould & Eberhardt's Machinists' Tools. See adv., p. 141.

Nickel Anodes, Salts, and Platers' Supplies of all kinds. Greene, Tweed & Co., 112 Chambers St., N. Y.

Barrel, Keg, Hogshead. Stave Mach'y. See ad., p. 142. Sewing Machines and Gun Machinery in Variety. The Pratt & Whitney Co., Hartford, Conn.

Helios, Blue Process, Paper; the best made; warranted. Sold at all stationers, or Keuffel & Esser, New

Aneroid Barometers, Mercurial Barometers, Ther- wrong sort of water lime, I understand. How can I

Mineral Lands Prospected, Artesian Wells Bored, by Pa. Diamond Drill Co. Box 423. Pottsville, Pa. See p. 140. built of brick saturated with asphalt, sides and bot-For best low price Planer and Matcher. and latest

improved Sash, Door, and Blind Machinery, Send for catalogue to Rowley & Hermance, Williamsport, Pa. C. B. Rogers & Co., Norwich, Conn., Wood Working

Machinery of every kind. See adv., page 142. The Porter-Allen High Speed Steam Engine. work Foundry & Mach. Co. 430 Washington Ave. Phil.Pa.

NEW BOOKS AND PUBLICATIONS.

FARLEY'S DIRECTORY OF THE HARDWARE varnish thinned with turpentine with a little drier added,
TRADE. Farley, Paul, and Baker, (3) J. writes: I want to lay a wrought iron Philadelphia.

This is a handsome octavo volume for office use, giv-This is a handsome octave volume for office use, giv-pipe for a hydraulic ram. This pipe I want to lay as a ing the addresses of the prominent hardware dealers siphon to carry the water over a hill, lifting the water throughout the country. The index and advertisements ten feet. The lower leg of siphon to be six feet below cover much more than the ordinary directory addresses, being guides to the most important manufacturers of

DICTIONARY OF USEFUL ANIMALS AND THEIR Vegetable Kingdom;" the "Commercial Products of the Sea," etc. Published by E. and F. N. Spon, London and New York.

This volume is a handy pocket book, containing in dictionary form a large amount of convenient information in its double columned pages, in relation to animals and what polishing powder do I want for polishing and their food, and other products of use to man agates? A. A felt buff, and rouge used wet. Buffsand drawn from animal sources.

HYDRAULIC TABLES, FOR THE CALCULATION OF THE DISCHARGE THROUGH SEWERS, PIPES, AND CONDUITS. By P. J. Flynn, C.E. D. Van Nostrand, New York.

These tables are based on Kutter's formula, and are reprinted from Van Nostrand's Magazine. The volume Blake's Patent Belt Studs. Most reliable fastening is intended to facilitate the calculation of velocities, the discharges, the slopes, and the dimensions of sewers; and the tables are calculated for circular and egg shaped sewers and conduits, giving their outside as well as inside dimensions, and providing a basis for calculation for amount of materials.

odes, pure nickel salts, polishing compositions, etc. Com-, THE_CHICAGO HERALD COOKING SCHOOL. By Jessup Whitehead, author of "The Oven and the Range" and other books. Daily Herald Publication, Chicago, Ill.

> 126 pages with an analytical index of 100 more pages, is evidently a professional cook, and probably a "home There is a flavor of appreciation in his descriptions that cannot be assumed. The author is evi-The recipes are plain and easily followed.



HINTS TO CORRESPONDENTS.

No attention will be paid to communications unless accompanied with the full name and address of the

given to inquirers.

 $We \, renew our \, request that correspondents, in \, referring$ to former answers or articles, will be kind enough to name the date of the paper and the page, or the number of the question.

Correspondents whose inquiries do not appear after a reasonable time should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them.

Persons desiring specialinformation which is purely of a personal character, and not of general interest, should remit from \$1 to \$5, according to the subject, as we cannot be expected to spend time and labor to obtain such information without remuneration

Any numbers of the Scientific American Supplies MENT referred to in these columns may be had at the office. Price 10 cents each.

Correspondents sending samples of minerals, etc., for examination, should be careful to distinctly mark or answer in Notes and Queries, I would be pleased. A. label their specimens so as to avoid error in their identi-

the chief engineer of our fire department made a test of great intensity which we hear and designate as a of the water pipes, the conditions about as follows: crack. The form of the lash, its gradual taper and the Four hydrants were opened at the same time, with the tipping with a small, fibrous, braided and knotted end following streams: 11/2 inch, 11/4 inch, 1 inch, three- are mechanical devices for facilitating the action of the cal Books, 14 pages. E. & F. N. Spon, 35 Murray St., N. Y. fourths of an inch, and sbut off as nearly as possible lash, and for wear. The fibrous or frayed end adds together and as quick as it could be done. The pres- much to the strength of the "crack" by spreading a sure was or is 135 pounds per inch. How much would large area to act upon the air. it increase by shutting off as was done? As there is considerable argument on the subject, some think the pressure would only return to the same point at which it was when the hydrants were opened, others, it would be more, and we have decided to leave it to you. The hydrants were supplied by a 6 and 4 inch main. A. Sudden shutting off of outlets in long mains is considered injurious, as it subjects the pipes and valves in the vicinity to what is called a water ram by causing a great and sudden increase of pressure, due to the momentum of the water under motion. The usual construction of hydrants is intended to prevent sudden shutting off, by the use of a screw. The amount of increase of pressure depends entirely upon the length and comparative size of the main and the suddeness of shutting off. Under extreme conditions such as an opening nearly the size of the main and shutting off with a large cock instead of a screw valve, the water ram would carry up the pressure to two or three times the original pressure, or burst the pipe.

out in the country-Jefferson-which is dug three feet in For Mill Mach'y & Mill Furnishing, see illus. adv. p.140. always contains soil water, it was masoned with the your wants. mometers, Anemometers, Hydrometers, Hygrometers. make it water tight, and what can it cost? A. If your Send for catalogue. Queen & Co., Philadelphia. cellar is in the low prairie that is water soaked, hydraulic lime will not save it. Such cellars have to be tom. This is somewhat difficult even here, where there are professional water tight cellar builders Better raise the whole cellar above water level, or cut a drain if possible. 2. The inside of my house was grained and varnished; the varnish sticks everywhere; \boldsymbol{J} was told said varnish was thinned down with oil, and \boldsymbol{I} varnished it over with good varnish but without any avail; it still sticks and I can not remedy it, how can I harden it? A. For your sticky varnish clean it off thoroughly with turpentine, and revarnish with good

pipe 800 feet long from a pond to supply a 4 inch stand diameter by 31/2 inches stroke. the water in the pond. How large a pipe must be laid to carry six gallons per minute? Will air get in and stop the siphon, or will it be constant in action? A. Theoretically a pipe 11/2 inches diameter should fur-PRODUCTS. By P. L. Simmonds, author nish more than 6 gallons per minute; but we would of the "Commercial Products of the advise not less than 134 inch pipe, as you cannot rely upon the pipe being perfectly tight. If there be leaks in the pipe, air will likely accumulate in the highest point, and at that point there should be a stop cock or plug, by which the air can be let off and the pipe recharged.

rouge can be had at any jeweler's tool store. The in use. grinding to a required surface can be done upon a grindstone. Grind with the stone very wet. If much is to be cut off, a copper or lead lap with emery and water will do the work quickly. The splitting by sawing is a tedious process, and hardly pays for an amateur. It can be done with a thin copper disk supplied with emery and water. It is better to get a lapidary to split with a diamond disk. You can split many minerals with a chisel and hammer by a little management. Agates will split fairly in various di-

(5) J. E. L. writes: We have now in use a 48 inch "Stout, Mills, and Temple" turbine wheel, with 72 inch flume, 36 inch draught tube. Now if we replace the 48 inch wheel with a 60 inch wheel, will we get more power, and will we use more water, and will there be any change in speed? A. You would get no The writer of this handsome illustrated octavo of more power with the 60 inch than with the 48 inch wheel, using the same amount of water. The periphery of the 60 inch must run the same as the 48 inch, so the revolution would be reduced as 48 to 60, and your gearing would have to be correspondingly altered. If you have the water, use more on the 48 inch wheel, or get a 48 inch wheel that will use more water; in this case you would not have to alter your gearing; with either a 48 inch or 60 inch wheel you must use more water to ge more power.

(6) R. W. M. writes: Some time ago I asked you how to take copies of a medal by a plaster of Paris mould. You referred me to Scientific AMERICAN SUPPLEMENT No. 17, which I ordered at a book store and duly received. I made a mould of plaster of Paris according to directions, and made an alloy of four parts tin and one part antimony as directed, but I can get hardly any impression at all, and all Names and addresses of correspondents will not be along the edge of the medal which I cast is full of superfluous metal, and thus the edge is not round, as it ought to be. Would you please tell me through your paper (SCIENTIFIC AMERICAN) how to get the impression and not have the superfluous metal on the edge of the medal? Please answer as soon as possible. A. Your composition is not fluid enough for medals. A composition of 69 parts lead, 15 parts antimony, 16 parts bismuth or old type, will make a fair cast. Fusible alloy, 19 parts tin, 13 parts lead, 40 parts bismuth, makes a better and finer impression and more suitable for plaster moulds. Make the plaster casts of each side of the medal separate. Trim and solder the pieces together with a fusible alloy that melts in boiling water. You can only get rid of the fins on the edge by careful moulding and dressing down the face of the mould

(7) J. H. F. writes: My boy has asked me to explain "why his whip cracks." If you see fit to The doubling of the lash itself produces an accelerating speed in the cracker, so that by the time it arrives at the end of its stroke, its velocity is very great. Its (1) C. G. H. writes: About ten days since sudden check and return produces a blow upon the air

(8) W. writes: Please give me your estimate of the value of a spring I have, and its capacity. The water is never failing, it fills a 3 inch pipe, and has a fall of nearly 100 feet. What horse power will it furnish for small machinery, such as sewing machines, elevators, electric light, etc.? Would there be power sufficient to unload vessels from a wharf? A. We call the head 100 feet, and supplying all the water which will pass through a 3 inch pipe under this head, you should get about 30 horse power with a good turbine wheel.

(9) F. K. asks: What is the best to burn in a small steam engine to heat water for generating steam? I want to use some kind of oil, but don't know which would be the best. A. For very small engines good cold strained lard oil is the best and safest. A boiler large enough to require from one to four full size kerosene lamps can be arranged with metallic I chimney for the whole so as to avoid the use of glass.

(2) G. S. writes: I have a cellar, 10x12x6, This is done in the kerosene cooking stoves, which you may find on sale at the hardware or stove stores. An the ground, no ditches in the neighborhood, which inspection of one may put you upon the right track for

> (10) T. A. S. writes: I have noticed one or two inquiries relative to the destruction of red ants. Your readers can rely upon the fact that five cents' worth of powdered borax will drive them all away. There is no danger in this method, and a spoonful sprinkled anywhere infested by them will give your correspondents every satisfaction.

(11) E. M. asks: Is there more power in vo cylinders 2 inches bore, 3½ inches stroke each, both working on same shaft, than a cylinder 4 inches bore, 41/2 inches stroke? And what is the difference in steam space and power? A party claims more power in the two cylinders on account of double or 7 inch stroke. A. Working at the same speed and under the same pressure, the 4 inch cylinder by $4\frac{1}{2}$ inches stroke (3) J. writes: I want to lay a wrought iron is more than double the power of two cylinders 2 inches

> (12) F. C. S. asks: What is hydrofluoric acid? A. Hydrofluoric acid is the chemical compound arising from the decomposition of calcium fluoride (fluorspar) by concentrated sulphuric acid. It can be procured through any wholesale druggist.

(13) J. W. B. asks: Does a rain gauge, or say a tin bucket, catch as much water in a given length of time if the water falls obliquely as if it falls perpendicularly, the vessel to stand level? A. It does not; but as the wind does not blow steadily in force or direction, no permanent inclination will satisfy the requirements. Experiments have been made on swing gauges much after the style of a marine compass, so (4) H. D. M. asks: What sort of a wheel that the force of the wind would tip the gauge to face the falling rain. They did not prove altogether satisfactory, and we do not know that there is any now

> (14) G. M. E. asks what the pressure of wind is to the square foot going at the rate of 25, 50, and 100 miles an hour. A. According to Wolff's table:

25 miles	2°97 lb	. per sqr. ft.
50 "	11.9	44
80 "	30.8	"
According to Smeaton:		
25 miles	3·1 lb	. per sqr. ft.
50 " ,	19.5	44
80 "	32	**
100 "	50	**

COMMUNICATIONS RECEIVED.

On Safety Lamps. By W. B. On Hotel Fires. By J. K.

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August 21, 1883.

AND EACH BEARING THAT DATE.

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Saw filing machine, C. F. Hill	
Saw tooth, insertible, E. T. Lippert	283,623
Scale, automatic car, C. Lederer	283,619
Scale pen for weighing cattle, A. Borror Jr Scraper, earth, A. R. Byrkett (r)	
Scraper, road E. Huber	
Screw cutting chuck, C. F. Steinmetz	283,679
Screw press. G. B. Boomer	
Scythe-snath nib iron, A. Lane	
Seat. See Vehicle jump seat.	
Separating solid matter from liquids, apparatus for, O. L. F. Browne	
Settee, invalid. J. Rodgers	283,515
Sewing machine, J. P. Scott	283,669
Sewing machine, C. A. Wood	
Shaft bending device, J. W. Dann	
Sheet metal perforating machine, J. W. Hyatt	283,488
Shoes, machine for attaching buttons to, P. H. Sweet, Jr. (r)	
Showcase and counter, F.G. Bufford	
Sign, N. Newman.	283,647
Size composition, Parke & Goldberg	
Sliding gate, F. Obenchain	
Snap hook, W. L. & A. C. Brown	283,464
Snap hook, G. D. Mosher	283,720
Soap, T. A. Kasey	
Soldering machine, can, J. G. Jones	
Sole.in, O. Long	
Spike machine, J. H. Shepherd	
M. Robinson	
Spokes, harrow teeth, etc., blank for, M. McDow-	
ell Spoon, H. J. Meyer	
Spout, sap. P. E. Fox.	
Spring. See Blind and door spring. Vehicle	
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Spring motor, W. H. Neff	
Stand. See Wash stand.	
Steam boiler. H. H. Lindemuth	
Steam boiler vertical, Sharpe & Palmer	
Steel, manufacture of. J. Giers	
Still, oil, J. B. Dubler	
Stone and emery, manufacture of artificial, B. Hess	999 609
Stone dressing lathe, F. Trier	
Stool, counter or table, J. J. Reynolds	283,512
Stopper. See Bottle stopper. Store service apparatus. E. Werner	288 548
Stove and furnace fire pot, J. V. D. Eldredge	283.584
Stove fire pot, R. Hatchman	283,602
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Supporter. See Abdominal supporter.	200,122
Surgical bandage. S. M. Furman	283,478
Sweeping machine, E. G. Passmore	283,415
Swing I N Porrector	289 280
Swing, I. N. Forrester Switch closer, automatic, C. L. Northrup	283,388 283,721
Swing, I. N. Forrester	283,388 28 3 ,721
Swing, I. N. Forrester Switch closer, automatic, C. L. Northrup Table. See Extension table. Library table. Telegraph, automatić, J. W. Rogers.	283,388 283,721 283,665
Swing, I. N. Forrester Switch closer, automatic, C. L. Northrup Table. See Extension table. Library table. Telegraph, automatic, J. W. Rogers. Telegraph transmitter. H. Lyon.	283,388 283,721 283,665
Swing, I. N. Forrester Switch closer, automatic, C. L. Northrup Table. See Extension table. Library table. Telegraph, automatic, J. W. Rogers Telegraph transmitter, H. Lyon. Telephone exchanges, signaling apparatus for, T. D. Lockwood	283,388 283,721 283,665 283,716
Swing, I. N. Forrester Switch closer, automatic, C. L. Northrup Table. See Extension table. Library table. Telegraph, automatic, J. W. Rogers. Telegraph transmitter. H. Lyon. Telephone exchanges, signaling apparatus for, T. D. Lockwood. Telephonic and telegraphic instruments, appara-	283,388 283,721 283,665 283,716 283,626
Swing, I. N. Forrester Switch closer, automatic, C. L. Northrup Table. See Extension table. Library table. Telegraph, automatic, J. W. Rogers Telegraph transmitter, H. Lyon. Telephone exchanges, signaling apparatus for, T. D. Lockwood	283,388 283,721 283,665 283,716 283,626 283,492
Swing, I. N. Forrester Switch closer, automatic, C. L. Northrup Table. See Extension table. Library table. Telegraph, automatic, J. W. Rogers. Telegraph transmitter. H. Lyon. Telephone exchanges, signaling apparatus for, T. D. Lockwood. Telephonic and telegraphic instruments, apparatus for protecting, F. E. Kinsman. Thrasher cylinder. A. G. Stewart. Thrasher machine feeder and band cutter.	283,388 283,721 283,665 283,716 263,626 283,492 283,529
Swing, I. N. Forrester Switch closer, automatic, C. L. Northrup Table. See Extension table. Library table. Telegraph, automatic, J. W. Rogers. Telegraph transmitter. H. Lyon. Telephone exchanges, signaling apparatus for, T. D. Lockwood. Telephonic and telegraphic instruments, apparatus for protecting, F. E. Kinsman. Thrasher cylinder. A. G. Stewart. Thrasher machine feeder and band cutter, Hughes & Blackwell.	283,388 283,721 283,665 283,716 283,626 283,492 283,529 283,710
Swing, I. N. Forrester Switch closer, automatic, C. L. Northrup Table. See Extension table. Library table. Telegraph, automatic, J. W. Rogers. Telegraph transmitter. H. Lyon. Telephone exchanges, signaling apparatus for, T. D. Lockwood. Telephonic and telegraphic instruments, apparatus for protecting, F. E. Kinsman. Thrasher cylinder. A. G. Stewart. Thrasher machine feeder and band cutter, Hughes & Blackwell. Thread holder, J. T. Walker	288,388 288,721 283,665 283,716 283,626 283,492 283,529 283,710 288,689
Swing, I. N. Forrester Switch closer, automatic, C. L. Northrup Table. See Extension table. Library table. Telegraph, automatic, J. W. Rogers. Telegraph transmitter. H. Lyon. Telephone exchanges, signaling apparatus for, T. D. Lockwood. Telephonic and telegraphic instruments, apparatus for protecting, F. E. Kinsman. Thrasher cylinder. A. G. Stewart. Thrasher machine feeder and band cutter, Hughes & Blackwell. Thread holder, J. T. Walker Tie. See Belt tie. Time lock, H. F. Newbury	288,388 288,721 283,665 283,716 283,626 283,492 283,529 283,710 288,689
Swing, I. N. Forrester Switch closer, automatic, C. L. Northrup Table. See Extension table. Library table. Telegraph, automatic, J. W. Rogers. Telegraph transmitter. H. Lyon. Telephone exchanges, signaling apparatus for, T. D. Lockwood. Telephonic and telegraphic instruments, apparatus for protecting, F. E. Kinsman. Thrasher cylinder. A. G. Stewart. Thrasher machine feeder and band cutter, Hughes & Blackwell. Thread holder, J. T. Walker. Tie. See Belt tia. Time lock, H. F. Newbury Tobacco, preparing extracts of, Liebreich &	283,665 283,716 283,626 283,626 283,626 283,629 283,529 283,689 283,645
Swing, I. N. Forrester Switch closer, automatic, C. L. Northrup Table. See Extension table. Library table. Telegraph, automatic, J. W. Rogers. Telegraph transmitter. H. Lyon. Telephone exchanges, signaling apparatus for, T. D. Lockwood. Telephonic and telegraphic instruments, apparatus for protecting, F. E. Kinsman. Thrasher cylinder. A. G. Stewart. Thrasher machine feeder and band cutter, Hughes & Blackwell. Thread holder, J. T. Walker. Tie. See Belt tia. Time lock, H. F. Newbury Tobacco, preparing extracts of, Liebreich &	283,665 283,716 283,626 283,626 283,626 283,629 283,529 283,689 283,645
Swing, I. N. Forrester Switch closer, automatic, C. L. Northrup Table. See Extension table. Library table. Telegraph, automatic, J. W. Rogers. Telegraph transmitter. H. Lyon. Telephone exchanges, signaling apparatus for, T. D. Lockwood. Telephonic and telegraphic instruments, apparatus for protecting, F. E. Kinsman. Thrasher cylinder. A. G. Stewart. Thrasher machine feeder and band cutter. Hughes & Blackwell Thread holder, J. T. Walker Tie. See Belt tie. Time lock, H. F. Newbury Tobacco, preparing extracts of, Liebreich & Michaelis Towing boat, J. Collins. Toy gun, W. S. Reed	283,685 283,716 283,665 283,716 283,626 283,492 283,529 283,710 283,689 283,645 283,645 283,622 283,573
Swing, I. N. Forrester Switch closer, automatic, C. L. Northrup Table. See Extension table. Library table. Telegraph, automatic, J. W. Rogers. Telegraph transmitter, H. Lyon. Telephone exchanges, signaling apparatus for, T. D. Lockwood. Telephonic and telegraphic instruments, apparatus for protecting, F. E. Kinsman. Thrasher oylinder. A. G. Stewart. Thrasher machine feeder and band cutter, Hughes & Blackwell. Thread holder, J. T. Walker Tie. See Belt tie. Time lock, H. F. Newbury Tobacco, preparing extracts of, Liebreich & Michaelis. Towing boat, J. Collins Toy gun, W. S. Reed. Trap. See Fish trap.	283,685 283,721 283,665 283,716 283,626 283,492 283,529 283,710 283,689 283,645 283,622 283,573 283,681
Swing, I. N. Forrester Switch closer, automatic, C. L. Northrup Table. See Extension table. Library table. Telegraph, automatic, J. W. Rogers. Telegraph transmitter. H. Lyon. Telephone exchanges, signaling apparatus for, T. D. Lockwood. Telephonic and telegraphic instruments, apparatus for protecting, F. E. Kinsman. Thrasher cylinder. A. G. Stewart. Thrasher machine feeder and band cutter. Hughes & Blackwell. Thread holder, J. T. Walker. Tie. See Belt tia. Time lock, H. F. Newbury Tobacco, preparing extracts of, Liebreich & Michaelis. Toy gun, W. S. Reed. Trap. See Fish trap. Treadle, J. A. Robison. Trimmer. See Wick trimmer.	283,388 283,721 283,665 283,716 283,626 283,529 283,529 283,689 283,645 283,622 283,573 283,681 283,514
Swing, I. N. Forrester Switch closer, automatic, C. L. Northrup Table. See Extension table. Library table. Telegraph, automatic, J. W. Rogers. Telegraph transmitter. H. Lyon. Telephone exchanges, signaling apparatus for, T. D. Lockwood. Telephonic and telegraphic instruments, apparatus for protecting, F. E. Kinsman. Thrasher oylinder. A. G. Stewart. Thrasher machine feeder and band cutter, Hughes & Blackwell. Thread holder, J. T. Walker. Tie. See Belt tie. Time lock, H. F. Newbury Tobacco, preparing extracts of. Liebreich & Michaelis. Towing boat, J. Collins Toy gun, W. S. Reed. Trap. See Fish trap. Treadle, J. A. Robison. Trimmer. See Wick trimmer. Truck, hand, W. P. Brown	283,588 283,721 283,665 283,716 283,626 283,492 283,529 283,710 283,689 283,645 283,622 283,573 283,681 283,514 283,562
Swing, I. N. Forrester Switch closer, automatic, C. L. Northrup Table. See Extension table. Library table. Telegraph, automatic, J. W. Rogers. Telegraph transmitter, H. Lyon. Telephone exchanges, signaling apparatus for, T. D. Lockwood. Telephonic and telegraphic instruments, apparatus for protecting, F. E. Kinsman. Thrasher cylinder, A. G. Stewart. Thrasher machine feeder and band cutter, Hughes & Blackwell. Thread holder, J. T. Walker. Tie. See Belt tie. Time lock, H. F. Newbury Tobacco, preparing extracts of, Liebreich & Michaelis. Towing boat, J. Collins. Toy gun, W. S. Reed. Trap. See Fish trap. Treadle, J. A. Robison. Trimmer. See Wick trimmer. Truck, hand, W. P. Brown Tubes, making circular disks for, S. Walker.	283,388 283,721 283,665 283,716 283,626 283,492 283,629 283,689 283,645 283,622 283,573 283,681 283,514 283,562 283,573
Swing, I. N. Forrester Switch closer, automatic, C. L. Northrup Table. See Extension table. Library table. Telegraph, automatic, J. W. Rogers. Telegraph transmitter. H. Lyon. Telephone exchanges, signaling apparatus for, T. D. Lockwood. Telephonic and telegraphic instruments, apparatus for protecting, F. E. Kinsman. Thrasher cylinder. A. G. Stewart. Thrasher machine feeder and band cutter, Hughes & Blackwell. Thread holder, J. T. Walker. Tie. See Belt tia. Time lock, H. F. Newbury Tobacco, preparing extracts of. Liebreich & Michaelis. Towing boat, J. Collins. Toy gun, W. S. Reed. Trap. See Fish trap. Treadle, J. A. Robison. Trimmer. See Wick trimmer. Truck, hand, W. P. Brown Tubes, making circular disks for, S. Walker. Tug, hame, W. Fawcett. Tuyere for forges, N. O. Swenson.	283,388 283,721 283,665 283,716 283,626 283,626 283,645 283,645 283,645 283,645 283,645 283,645 283,622 283,573 283,681 283,514 283,572 283,727 283,884
Swing, I. N. Forrester Switch closer, automatic, C. L. Northrup Table. See Extension table. Library table. Telegraph, automatic, J. W. Rogers. Telegraph transmitter, H. Lyon. Telephone exchanges, signaling apparatus for, T. D. Lockwood. Telephonic and telegraphic instruments, apparatus for protecting, F. E. Kinsman. Thrasher cylinder. A. G. Stewart. Thrasher machine feeder and band cutter, Hughes & Blackwell. Thread holder, J. T. Walker. Tie. See Belt tie. Time lock, H. F. Newbury Tobacco, preparing extracts of, Liebreich & Michaelis. Towing boat, J. Collins. Toy gun, W. S. Reed. Trap. See Fish trap. Treadle, J. A. Robison. Trimmer. See Wick trimmer. Truck, hand, W. P. Brown Tubes, making circular disks for, S. Walker. Tug, hame, W. Fawcett. Tuyere for forges, N. O. Swenson. Type witting ruler, H. B. Mead.	283,388 283,7121 283,665 283,716 283,626 283,492 283,629 283,689 283,645 283,645 283,681 283,573 283,681 283,574 283,572 283,727 282,475 282,475 283,504
Swing, I. N. Forrester Switch closer, automatic, C. L. Northrup Table. See Extension table. Library table. Telegraph, automatic, J. W. Rogers. Telegraph transmitter. H. Lyon. Telephone exchanges, signaling apparatus for, T. D. Lockwood. Telephonic and telegraphic instruments, apparatus for protecting, F. E. Kinsman. Thrasher cylinder. A. G. Stewart. Thrasher machine feeder and band cutter, Hughes & Blackwell. Thread holder, J. T. Walker. Tie. See Belt tia. Time lock, H. F. Newbury Tobacco, preparing extracts of, Liebreich & Michaelis. Towing boat, J. Collins. Toy gun, W. S. Reed. Trap. See Fish trap. Treadle, J. A. Robison. Trimmer. See Wick trimmer. Truck, hand, W. P. Brown Tubes, making circular disks for, S. Walker. Tug, hame, W. Fawcett Tuyere for forges, N. O. Swenson Type writing ruler, H. B. Mead. Vacuum apparatus. E. Weston.	283,388 283,721 283,665 283,716 283,626 283,529 283,529 283,689 283,645 283,622 283,573 283,681 283,561 283,573 283,672 283,77 282,475 283,77 282,475 283,545 283,545
Swing, I. N. Forrester Switch closer, automatic, C. L. Northrup Table. See Extension table. Library table. Telegraph, automatic, J. W. Rogers. Telegraph transmitter. H. Lyon. Telephone exchanges, signaling apparatus for, T. D. Lockwood. Telephonic and telegraphic instruments, apparatus for protecting, F. E. Kinsman. Thrasher orlinder. A. G. Stewart. Thrasher machine feeder and band cutter, Hughes & Blackwell. Thread holder, J. T. Walker. Tie. See Belt tie. Time lock, H. F. Newbury Tobacco, preparing extracts of, Liebreich & Michaelis. Towing boat, J. Collins Toy gun, W. S. Reed. Trap. See Fish trap. Treadle, J. A. Robison. Trimmer. See Wick trimmer. Truck, hand, W. P. Brown Tubes, making circular disks for, S. Walker. Tug, hame, W. Fawcett Tuyer for forges, N. O. Swenson. Type writing ruler, H. B. Mead Vacuum apparatus, E. Weston. Vacuums, apparatus for producing, E. Weston. Valve, T. & J. Galvin.	283,388 283,721 283,665 283,716 283,626 283,492 283,529 283,689 283,645 283,645 283,645 283,573 283,681 283,514 283,514 283,562 283,727 282,475 283,452 283,546 283,546 283,546 283,546 283,546 283,547 283,547 283,547 283,547 283,547 283,547
Swing, I. N. Forrester Switch closer, automatic, C. L. Northrup Table. See Extension table. Library table. Telegraph, automatic, J. W. Rogers. Telegraph transmitter. H. Lyon. Telephone exchanges, signaling apparatus for, T. D. Lockwood. Telephonic and telegraphic instruments, apparatus for protecting. F. E. Kinsman. Thrasher cylinder. A. G. Stewart. Thrasher machine feeder and band cutter, Hughes & Blackwell. Thread holder, J. T. Walker. Tie. See Belt tia. Time lock, H. F. Newbury Tobacco, preparing extracts of, Liebreich & Michaelis. Towing boat, J. Collins. Toy gun, W. S. Reed. Trap. See Fish trap. Treadle, J. A. Robison. Trimmer. See Wick trimmer. Truck, hand. W. P. Brown Tubes, making circular disks for, S. Walker. Tug. hame, W. Fawcett Tuyere for forges, N. O. Swenson Type writing ruler, H. B. Mead. Vacuum apparatus. E. Weston. Valve, T. & J. Galvin. Valve, T. & J. Galvin.	283,388 283,721 283,665 283,716 283,626 283,492 283,689 283,689 283,645 283,645 283,622 283,573 283,681 283,561 283,572 283,77 282,475 283,549 283,549 283,549 283,549 283,549 283,549
Swing, I. N. Forrester Switch closer, automatic, C. L. Northrup Table. See Extension table. Library table, Telegraph, automatic, J. W. Rogers. Telegraph transmitter, H. Lyon. Telephone exchanges, signaling apparatus for, T. D. Lockwood. Telephonic and telegraphic instruments, apparatus for protecting, F. E. Kinsman. Thrasher cylinder, A. G. Stewart. Thrasher machine feeder and band cutter, Hughes & Blackwell. Thread holder, J. T. Walker. Tie. See Belt tia. Time lock, H. F. Newbury Tobacco, preparing extracts of, Liebreich & Michaelis. Toy gun, W. S. Reed. Trap. See Fish trap. Treadle, J. A. Robison. Trimmer. See Wick trimmer. Truck, hand. W. P. Brown Tubes, making circular disks for, S. Walker. Tug, hame, W. Fawcett. Tuyere for forges, N. O. Swenson Type writing ruler, H. B. Mead. Vacuum apparatus E. Weston. Valve, T. & J. Galvin Valve, Dalanced, C. F. Taylor. Valve, balanced, C. F. Taylor. Valve gear, steam engine, W. B. Turman.	283,388 283,721 283,665 283,716 283,626 283,529 283,529 283,645 283,622 283,573 283,612 283,514 283,562 283,773 283,514 283,562 283,773 283,475 283,475 283,544 283,544 283,549
Swing, I. N. Forrester Switch closer, automatic, C. L. Northrup Table. See Extension table. Library table. Telegraph, automatic, J. W. Rogers. Telegraph transmitter, H. Lyon. Telephone exchanges, signaling apparatus for, T. D. Lockwood. Telephonic and telegraphic instruments, apparatus for protecting, F. E. Kinsman. Thrasher orlinder, A. G. Stewart. Thrasher machine feeder and band cutter, Hughes & Blackwell. Thread holder, J. T. Walker. Tie. See Belt tie. Time lock, H. F. Newbury Tobacco, preparing extracts of. Liebreich & Michaelis. Towing boat, J. Collins. Toy gun, W. S. Reed. Trap. See Fish trap. Treadle, J. A. Robison. Trimmer. See Wick trimmer. Truck, hand, W. P. Brown Tubes, making circular disks for, S. Walker. Tuyere for forges, N. O. Swenson Type writing ruler, H. B. Mead. Vacuum apparatus for producing, E. Weston. Valve, T. & J. Galvin. Valve, balanced, C. F. Taylor. Varnish, furniture, G. Wright. Vault cover fastening, C. H. Ross.	283,388 283,7121 283,665 283,716 283,626 283,492 283,689 283,645 283,645 283,645 283,673 283,681 283,573 283,681 283,573 283,5
Swing, I. N. Forrester Switch closer, automatic, C. L. Northrup Table. See Extension table. Library table. Telegraph, automatic, J. W. Rogers. Telegraph transmitter. H. Lyon. Telephone exchanges, signaling apparatus for, T. D. Lockwood. Telephonic and telegraphic instruments, apparatus for protecting. F. E. Kinsman. Thrasher cylinder. A. G. Stewart. Thrasher machine feeder and band cutter, Hughes & Blackwell. Thread holder, J. T. Walker. Tie. See Belt tia. Time lock, H. F. Newbury Tobacco, preparing extracts of, Liebreich & Michaelis. Towing boat, J. Collins. Toy gun, W. S. Reed. Trap. See Fish trap. Treadle, J. A. Robison. Trimmer. See Wick trimmer. Truck, hand. W. P. Brown Tubes, making circular disks for, S. Walker. Tug. hame, W. Fawcett Tuyere for forges, N. O. Swenson Type writing ruler, H. B. Mead. Vacuum apparatus. E. Weston. Vacuums, apparatus for producing. E. Weston. Valve, T. & J. Galvin Valve, Balanced, C. F. Taylor. Vault cover fastening, C. H. Ross. Vegetable cutter. E. L. Byron.	283,388 283,721 283,665 283,716 283,626 283,492 283,689 283,689 283,645 283,645 283,611 283,561 283,561 283,572 283,777 282,475 283,562 283,777 283,450 283,549 283,54
Swing, I. N. Forrester Switch closer, automatic, C. L. Northrup Table. See Extension table. Library table. Telegraph, automatic, J. W. Rogers. Telegraph transmitter, H. Lyon. Telephone exchanges, signaling apparatus for, T. D. Lockwood. Telephonic and telegraphic instruments, apparatus for protecting, F. E. Kinsman. Thrasher orlinder, A. G. Stewart. Thrasher machine feeder and band cutter, Hughes & Blackwell. Thread holder, J. T. Walker. Tie. See Belt tie. Time lock, H. F. Newbury Tobacco, preparing extracts of. Liebreich & Michaelis. Towing boat, J. Collins. Toy gun, W. S. Reed. Trap. See Fish trap. Treadle, J. A. Robison. Trimmer. See Wick trimmer. Truck, hand, W. P. Brown Tubes, making circular disks for, S. Walker. Tuyere for forges, N. O. Swenson Type writing ruler, H. B. Mead. Vacuum apparatus for producing, E. Weston. Valve, T. & J. Galvin. Valve, balanced, C. F. Taylor. Varnish, furniture, G. Wright. Vault cover fastening, C. H. Ross.	283,388 283,7121 283,665 283,716 283,626 283,492 283,639 283,645 283,645 283,645 283,645 283,573 283,681 283,514 283,514 283,562 283,777 283,869 283,492 283,492 283,493 283,504 283,504 283,504 283,517 283,582 283,592 283,593 283,490 283,517
Swing, I. N. Forrester Switch closer, automatic, C. L. Northrup Table. See Extension table. Library table. Telegraph, automatic, J. W. Rogers. Telegraph transmitter. H. Lyon. Telephone exchanges, signaling apparatus for, T. D. Lockwood. Telephonic and telegraphic instruments, apparatus for protecting. F. E. Kinsman. Thrasher cylinder. A. G. Stewart. Thrasher machine feeder and band cutter, Hughes & Blackwell. Thread holder, J. T. Walker. Tie. See Belt tia. Time lock, H. F. Newbury Tobacco, preparing extracts of, Liebreich & Michaelis. Towing boat, J. Collins. Toy gun, W. S. Reed. Trap. See Fish trap. Treadle, J. A. Robison. Trimmer. See Wick trimmer. Truck, hand. W. P. Brown Tubes, making circular disks for, S. Walker. Tug. hame, W. Fawcett. Tuyere for forges, N. O. Swenson Type writing ruler, H. B. Mead Vacuum apparatus. E. Weston. Valve, T. & J. Galvin. Valve, Balanced, C. F. Taylor. Valve gear, steam engine, W. B. Turman. Vanish, furniture. G. Wright. Vault cover fastening. C. H. Ross. Vegetable cutter. E. L. Byron. Vehicle spring, Smith & Weitzell. Vehicle spring, Smith & Weitzell. Vehicle spring, W. H. Stickle (r).	283,388 283,721 283,665 283,716 283,626 283,492 283,689 283,689 283,645 283,622 283,573 283,661 283,572 283,562 283,777 282,475 283,562 283,572 283,546 283,549 283,549 283,549 283,549 283,549 283,549 283,549 283,549 283,549 283,549 283,549 283,549 283,549 283,579 283,552 283,538 283,450 283,450 283,450 283,570 283,466 283,370 283,466 283,370 283,466 283,370 283,466 283,370 283,466 283,570 283,466 283,570 283,466
Swing, I. N. Forrester Switch closer, automatic, C. L. Northrup Table. See Extension table. Library table. Telegraph, automatic, J. W. Rogers. Telegraph transmitter. H. Lyon. Telephone exchanges, signaling apparatus for, T. D. Lockwood. Telephonic and telegraphic instruments, apparatus for protecting, F. E. Kinsman. Thrasher exclinder. A. G. Stewart. Thrasher machine feeder and band cutter. Hughes & Blackwell. Thread holder, J. T. Walker. Tie. See Belt tia. Time lock, H. F. Newbury Tobacco, preparing extracts of. Liebreich & Michaelis. Towing boat, J. Collins. Toy gun, W. S. Reed. Trap. See Fish trap. Treadle, J. A. Robison. Trimmer. See Wick trimmer. Truck, hand. W. P. Brown Tubes, making circular disks for, S. Walker. Tuyere for forges, N. O. Swenson. Type writing ruler, H. B. Mead Vacuum apparatus. E. Weston. Valve, Dalanced, C. F. Taylor. Valve gear, steam engine, W. B. Turman. Varnish, furniture. G. Wright. Vault cover fastening. C. H. Ross. Vegetable cutter. E. L. Byron. Vehicle spring, Smith & Weitzell. Vehicle spring, Smith & Weitzell. Vehicle spring, Smith & Weitzell. Vehicle spring, W. H. Stickle (r). Vehicle. two-wheeled, J. H. Bustin.	283,388 283,721 283,665 283,716 283,626 283,529 283,645 283,645 283,645 283,645 283,645 283,645 283,572 283,570 283,570 283,570 283,570 283,570 283,570 283,575 283,685
Swing, I. N. Forrester Switch closer, automatic, C. L. Northrup Table. See Extension table. Library table. Telegraph, automatic, J. W. Rogers. Telegraph transmitter. H. Lyon. Telephone exchanges, signaling apparatus for, T. D. Lockwood. Telephonic and telegraphic instruments, apparatus for protecting. F. E. Kinsman. Thrasher cylinder. A. G. Stewart. Thrasher machine feeder and band cutter, Hughes & Blackwell. Thread holder, J. T. Walker. Tie. See Belt tia. Time lock, H. F. Newbury Tobacco, preparing extracts of, Liebreich & Michaelis. Towing boat, J. Collins. Toy gun, W. S. Reed. Trap. See Fish trap. Treadle, J. A. Robison. Trimmer. See Wick trimmer. Truck, hand. W. P. Brown Tubes, making circular disks for, S. Walker. Tug. hame, W. Fawcett. Tuyere for forges, N. O. Swenson Type writing ruler, H. B. Mead Vacuum apparatus. E. Weston. Valve, T. & J. Galvin. Valve, Balanced, C. F. Taylor. Valve gear, steam engine, W. B. Turman. Vanish, furniture. G. Wright. Vault cover fastening. C. H. Ross. Vegetable cutter. E. L. Byron. Vehicle spring, Smith & Weitzell. Vehicle spring, Smith & Weitzell. Vehicle spring, W. H. Stickle (r).	283,388 283,721 283,665 283,716 283,626 283,492 283,529 283,645 283,645 283,645 283,645 283,645 283,573 283,681 283,514 283,562 283,777 282,475 283,456 283,546 283,546 283,547 283,546 283,547 283,546 283,570 283,552 10,372
Swing, I. N. Forrester Switch closer, automatic, C. L. Northrup Table. See Extension table. Library table. Telegraph, automatic, J. W. Rogers. Telegraph transmitter. H. Lyon. Telephone exchanges, signaling apparatus for, T. D. Lockwood. Telephonic and telegraphic instruments, apparatus for protecting, F. E. Kinsman. Thrasher exchinder. A. G. Stewart. Thrasher machine feeder and band cutter. Hughes & Blackwell. Thread holder, J. T. Walker. Tie. See Belt tia. Time lock, H. F. Newbury Tobacco, preparing extracts of. Liebreich & Michaelis. Towing boat, J. Collins. Toy gun, W. S. Reed. Trap. See Fish trap. Treadle, J. A. Robison. Trimmer. See Wick trimmer. Truck, hand. W. P. Brown. Tubes, making circular disks for, S. Walker. Tug. hame, W. Fawcett. Tuyere for forges, N. O. Swenson. Type writing ruler, H. B. Mead. Vacuum apparatus. E. Weston. Valve, T. & J. Galvin. Valve, Balanced, C. F. Taylor. Valve gear, steam engine, W. B. Turman. Varnish, furniture, G. Wright. Vault cover fastening, C. H. Ross. Vegetable cutter, E. L. Byron. Vehicle spring, Smith & Weitzell. Vehicle spring, Smith & Weitzell. Vehicle wheel, J. J. Bush. Velocipede, A. J. Branham. Velocipede wheel, Overman & Hadley.	283,388 283,721 283,665 283,716 283,626 283,529 283,645 283,645 283,645 283,645 283,571 283,571 283,562 283,772 283,583 283,504 283,608 283,507 283,808 283,608 283,608 283,608 283,608 283,608 283,608 283,608 283,608 283,608 283,608 283,608 283,608 283,608 283,608 283,608 283,608
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Gum setting, H. G. Mackinney 14,225
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Sewing machine side drawer case and drawer, G.
B. Hooper
Shawl, woven, F. A. Woodhead 14,284
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Vase. C. Nardini 14,226
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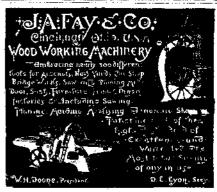
lager, National Lager Beer Bottling Compreparation, self-raising, Rumford Chemi-co, chewing, Winfree & Loyd 10,543 co, plug, Berry Bros 10,524 co, plug, Winfree & Loyd 10.542, 10.544 V. rye and other, Cardeza. Gilliams & Co.... 10,529 champagne, T. Roederer & Co......10,582 to 10,584 Luyties Brothers...... 10 539 en dress goods, Megroz, Portier. Grose & Co. 10.540

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