tion to the plan, provided the ends of the glass tube are fused to remove the sharp edge. By attaching a small platinum point (about the size of a pin's head) to the diaphragm instead of the carbon button the effective ness of the instrument will be increased. 4. What size should the platinum wire be? A. It is immaterial; copper wire will answer just as well if used in the manner proposed by you.

(31) J. H. writes: 1. Our mechanic has made a dynamo machine as designed in Supplement. No. 161, which did not work before it was connected with a battery, and after it was disconnected from the battery about an hour it began to work, and has done so ever since. Now, will a dynamo machine work without it being charged with a battery? A. Iron is usually more or less magnetic, and the slightest degree of magnetism in the iron of your field magnet would have been sufficient to start a current in the armature, THE which would have increased rapidly until the maximum current was reached. It seems that your field magnet must have been neutral. After having been charged by the battery it retained sufficient magnetism to start the current. It has been found that when the field magnet is neutral sufficient magnetism to start the machine may be imparted to it by placing it on the earth's magnetic meridian. 2. Can you give us a design of a dynamo machine which is strong enough to magnetize a piece of steel in the form of a norsestoe magnet which is 12 inches long, 11/2 inch wide, and 1/2 inch thick? A. For this purpose you would need a large machine such as the Edison, Maxim, Brush, Weston, or Siemens, all of which have been described in our columns.

(32) J. P. E. writes: 1. In a late edition of your valuable paper you give directions for building an upright, single-acting rocking valve engine. Please tell me how I can get up a cheap, effective, steam supply for an engine on that principle, having 2 inch bore, and 21/2 inch stroke. Would a copper boiler, 11 inches in diameter and 22 inches long, tested to stand 150 lb. to square inch, with 4 4-inch wicks burning good refined petroleum, be at all effective and efficient? A. Such a boiler should have 20 to 25 1-inch tubes. You would hardly get the full power of the boiler with the four wicks. 2. Would a grate burning fine coal be better than the oil supply? A. Yes, much better. 3. What should be bore and stroke for a pump for engine of given dimensions. A. A pump having a piston onequarter inch in diameter and 1 inch stroke would be sufficient to supply the boiler. It would be well to make either the speed or stroke of the pump variable.

(33) P. S. writes: I would like to make an induction coil, but I think the one in Scientific AMERICAN SUPPLEMENT, No. 160, too large, and in the Scientific American, vol. xxxix., page 203, No. 14, too small. Would you please answer me the following questions. 1. Would a coil 41/2 inches long on inside, by 216 inches diameter, be too large to give shocks, using small battery power? A. It would not be too large, as you can regulate the strength of the current as may be required. 2. If not, please give diameter of core, weight, and number of primary and secondary wire? A. Diameter of core, five-eighths inch. Three layers of No. 18 silk covered wire for a primary, and 12 to 14 layers of No. 36 silk covered wire for the secondary. 3. Would a thin brass tube covering the wires of core which draw outto regulate the current, keep the coil from working? A. It would modify the action somewhat, but it would not entirely prevent its working.

(34) F. S. P. asks (1) how the connections are made in a "Gramme electro-magnetic" machine. SMITHSONIAN MISCELLANEOUS COLLECTIONS. After having wound the soft iron ring armature with a number of lengths of insulated wire, how are the ends of these coils of wire connected to the copper strips upon the axis? A. The inside terminal of one coil is connected with the outside terminal of the next, and both together are connected with one of the copper strips, and so on throughout the entire series of coils and strips. 2. What position do these strips of copper have upon the axis as the coil passes from north to south pole of the magnet? A. The strips are parallel with the axis, and the collector brushes which press upon opposite sides of the commutator cylinder should be adjustable, so that they may be moved from the neu-

(35) S. R. M. asks: Could a telegraph message be sent over a wire of any length, one end being AMERICAN SANITARY ENGINEERING. By well grounded in the earth, the other in a large water Edward S. Philbrick, C.E. New York: tank or lake of any size which was well insulated from the earth? A. No; a complete circuit is required

(36) H. B. writes: Referring to an article in your paper some time since, "How far can cannonading be heard?" would say many of us (I among them) distinctly heard, two days (and think three) in succession, at Lynchburg, Va., while prisoners in the rebel lines, the sound of the guns of McClellan's battles on the Peninsula. It was clearly heard towards close of the afternoon, days bright and clear sky. It sounded like a bucket being dropped inverted in more obvious sanitary needs. The water. Whatever the distance is, there is no mistake

(37) S. R. asks: What is the longest railway bridge in the world? A. It is said that the railway bridge over the estuary of the Solway, near Annan, is the longest in the world, being 1.940 vards in length. The next longest to it is that built for the Orenberg railway over the Volga near Syzrau, which is a few yards short of 1,624 yards.

(38) A. B. M. inquires: How is pyroligneous acid (wood vinegar) made? A. It is obtained by distilling wood in iron retorts, resembling those used for making illuminating gas. The condensed products of the distil'ation contain, with tar and numerous other bodies, crude pyroligneous acid or wood vinegar, amounting in a well conducted distillation to about 7 or 8 per cent of the wood employed. The gas that accompanies the with lime, evaporated to dryness, roasted at a moderate temperature so as to free it from volatile matters, and decomposed in a retort, having a helm of copper and a condenser of tin or silver, with hydrochloric acid (90 to mitigate.

parts acid to 100 acetate of lime), and the acetic acid

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

D. R. Y .- No. 1. Hornblende schist. No. 2. Red sandstone. No. 3. Dolerite. No. 4. Cherty flint.

COMMUNICATIONS RECEIVED.

On Parhelia. By U. F. G. On a Simple Experiment with Polarized Light. By E. G. H

Ona Singular Atmospheric Phenomenon. By H. B. C.

NEW BOOKS AND PUBLICATIONS.

LOGICAL-MATHEMATICAL DEVELOP-

The logical-mathematical development of the causes of the principal phenomena of nature, such as gravity. fications not being printed, must be copied by hand. elesticity, light, color, heat, electricity, chemical combinations, etc., from a single fundamental principle. By Theodor Wiesemann. Brussels 1879. Paper, 63

THE PHOTOGRAPHIC TIMES.

The Photographic Times, which was formerly issued, as an addendum to the Philadelphia Photographer, began the new year of 1881 as an independent publication, with an able editor-Mr. J. Trall Taylor, formerly of the British Journal of Photography. The January number of the Photographic Times, now before us, contains a large amount of matter of interest and value to practitioners of the art beautiful. \$2 a year. Single copies 25 cents. Scovill Manufacturing Company, publishers, 419 Broome street, New York

Johnston's Illustrations of Electricity. METALS. WITH HAND-BOOK. By Alexander Watt. Edinburgh and London: W. & A. K. Johnston. 10s. Size 50x 42 inches.

One of a series of charts in color for use in teaching natural philosophy. The illustrations of apparatus, etc., are large, so as to be readily seen by a class, and the several parts are colored as in the objects themselves. The sheet before us pictures twenty-three forms of voltaic battery, dynamo-electric machines and their elements, thermo-electric apparatus, and apparatus for electrotyping, electroplating, gilding, nickel plating, etc. The hand book briefly describes the objects figured and their uses. The charts would seem to be admirably adapted for use in schools unprovided with a physical laboratory; and if the price were reasonable say fifty cents or less a sheet, they might find a wide acceptance among our common and private schools.

A TEXT BOOK OF ELEMENTARY MECHANICS FOR THE USE OF SCHOOLS AND COL-LEGES. By Fdward S. Dana. New York: John Wiley & Sons.

Though specially designed for use in schools this eleentary treatise seems well adapted for individual study. Its scope is limited to the mechanics of solids. It would add much to the practical value of the mathematical courses in our schools if a treatise like this could take the place occupied by surveying, navigation, or mathematical astronomy.

JAMES SMITHSON AND HIS BEQUEST. By William J. Rhees. Washington: Published by the Smithsonian Institution.

This is the first authentic account of the man who has laid the United States and the world at large under such great obligation by his bequest to found the insti-tution which bears his name. Though barred by law from claiming the family name and honors of his father, the Duke of Northumberland, Smithson sought a higher fame in the discovery and propagation of scientific truth. In one of his manuscripts was found this memorable prophecy following a reference to his relationship to England's noblest families: "My name shall live in tral point to the point where the maximum current is the memory of man when the titles of the Northumberlands and the Percies are extinct and forgotten.' The prophecy bids fair to come true.

> The Sanitary Engineer. 8vo, cloth, pp. 129.

A dozen lectures covering in a peculiarly suggestive and practical manner the subjects of ventilation, house and town drainage, sewerage, and the like. The matter is presented in a way well calculated to command at. tention from home makers as well as house builders and sanitary engineers. The methods and appliances recommended have been chosen for their fitness to meet the conditions of our climate, our modes of life, and fect of the book is the lack of an index.

DEBAUN'S PRACTICAL CALCULATOR, No. 1. New York: Bicknell & Comstock. Folio. 50 cents.

A multiplication table extended to 100x100; and very compactly arranged, so that one can readily find at a glance the product of any two numbers within the limit. Obviously it can be used as a division table with equal readiness, and with slight figuring extended to products and quotients of larger numbers.

CIRCULARS OF INFORMATION OF THE BUREAU OF EDUCATION. No. 4. RURAL SCHOOL ARCHITECTURE. No. 5. ENGLISH RURAL Washington: Government SCHOOLS. Printing Office. 1880.

The Bureau of Education is doing good service in preparing and distributing information of the kind given liquefiable distillates is conducted to the furnace under in these circulars. They should go not only to all the retort, and serves to continue the distillation with- school officers or communities intending to build schoolout other fuel. In purifying the acid, it is first saturated houses, but to every school district in the land, for the instruction of school trustees, teachers, and parents. There is a vast amount of barbarism in and about our country school-houses which these circulars will help [OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH

Letters Patent of the United States were Granted in the Week Ending

January 25, 1881, AND EACH BEARING THAT DATE.

[Those marked (r) are reissued patents.]

A printed copy of the specification and drawing of any patent in the annexed list, also of any patent issued since 1866, will be furnished from this office for one dollar. In ordering please state the number and date of the patent desired and remit to Munn & Co., 37 Park Row. New York city. We also furnish copies of patents granted prior to 1866; but at increased cost, as the speci-

Air compressor, J. R. Cushier		
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Book, scrap, C. Sneider		
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T. & J. Cochran Electro-magnetic brake, Walter, Duwelins, & Merrell. Evaporating solutions in contact with air or other gas, apparatus for, J. L. Faesch. Evaporator, F. S. Harman. Exhibiting case, J. M. Clapp Farm gate, J. Bovee. Fence, J. Kinney Fence bart former, wire, Poofer & Jones (r). Fence, portable, C. F. Bahnson. Fertilizer distributers, feed cup for, W. Marks Fertilizers, machine for disintegrating and drying G. Mercer Fire kindler, Hammer & Grether	236,966 237,071 236,940 236,946 236,937 236,872 237,024 9,543 236,971 236,892 236,900 237,080 237,080 237,080 236,989 236,998	Tire tightener, J. R. Bell 23 Tool handle, I. W. Heysinger 22 Tool handle, H. B. Sherwood 23 Tool or implement, hand, E. T. Starr 23 Truss, L. Westinghouse 22 Turret, turret skylight, etc., G. Hayes 23 Undervest, J. L. Copp 23 Valive, balanced slide, J. B. Mayer 23 Valve, check, F. Lunkenheimer 23 Vegetables and fruit, apparatus for and process of drying, A. J. Emery 23 Vehicle spring, E. J. Moore 23 Vehicle spring, H. G. Steenburgh 23 Vehicle spring, J. Tilton (r) 24 Washing machine, W. F. Ashcraft 23 Watch case opener, Heyse & Tuerlingx 23
T. & J. Cochran Electro-magnetic brake, Walter, Duwelins, & Merrell. Evaporating solutions in contact with air or other gas, apparatus for, J. L. Faesch. Evaporator, F. S. Harman Exhibiting case, J. M. Clapp Farm gate, J. Bovee. Fence, J. Kinney. Fence barb former, wire, Pooler & Jones (r). Fence, portable, C. F. Bahnson Fence, portable, J. M. Keller. Fertilizer distributers, feed cup for, W. Marks. Fertilizers, machine for disintegrating and drying, G. Mercer. Fire kindler, Hammer & Greher. Fire service harness, R. Hudle. Flood gate, W. Donnan. Form, dress, J. Hall.	236,986 237,071 236,940 236,946 236,942 236,934 236,872 237,024 9,543 236,992 236,990 237,080 236,952 236,952 236,952 236,952 236,952 236,952 236,952 236,952 236,952 236,952 236,952 236,952 236,952	Tire tightener, J. R. Bell 23 Tool handle, I. W. Heysinger 23 Tool or implement, hand, E. T. Starr 23 Tool or implement, hand, E. T. Starr 23 Truss, L. Westinghouse 22 Turret, turret skylight, etc., G. Hayes 23 Undervest, J. L. Copp 23 Valye, balanced slide, J. B. Matthews 23 Valve, beck, F. Lunkenheimer 23 Velyetables and fruit, apparatus for and process of drying, A. J. Emery 23 Vehicle spring, E. J. Moore 23 Vehicle spring, H. G. Steenburgh 23 Vehicle spring, J. Tilton (r) 24 Watch case opener, Heyse & Tuerling 23 Watch key, A. N. Clark 23 Water closet, H. C. Meyer 23 Water closet, C. H. Moore 23 Water clovator, W. A. & R. T. Smith 23
T. & J. Cochran Electro-magnetic brake, Walter, Duwelins, & Merrell. Evaporating solutions in contact with air or other gas, apparatus for, J. L. Faesch. Evaporator, F. S. Harman. Exhibiting case, J. M. Clapp Farm gate, J. Bovee. Fence, J. Kinney. Fence bart former, wire, Pooler & Jones (r). Fence, portable, G. F. Bahnson. Fence, portable, J. M. Keller. Fertilizer distributers, feed cup for, W. Marks Fertilizers, machine for disintegrating and drying, G. Mercer. Fire kindler, Hammer & Gremer. Fire service harness, R. Hudle. Flood gate, W. Donnan. Form, dress, J. Hall. Game, A. O. Hall. Game, A. O. Hall. Game board, puzzle, C. J. Schumaker.	236,986 237,071 236,940 236,946 236,945 236,934 236,872 237,024 9,543 236,972 236,900 237,080 236,989 236,989 236,989 236,989 236,987 237,023	Tire tightener, J. R. Bell 23 Tool handle, I. W. Heysinger 22 Tool or landle, H. B. Sherwood 23 Tool or implement, hand, E. T. Starr 23 Truss, L. Westinghouse 23 Turret, turret skylight, etc., G. Hayes 23 Undervest, J. L. Copp 23 Valye, balanced slide, J. B. Matthews 23 Valve, check, F. Lunkenheimer 23 Vegetables and fruit, apparatus for and process of drying, A. J. Emery 23 Vehicle spring, E. J. Moore 23 Vehicle spring, J. Tilton (r) 24 Watch case opener, Heyse & Tuerlingx 23 Watch key, A. N. Clark 23 Water closet, H. C. Meyer 23 Water elevator, W. A. & R. T. Smith 23 Watifiteree and double tree, R. W. Davis 33
T. & J. Cochran Electro-magnetic brake, Walter, Duwelins, & Merrell. Evaporating solutions in contact with air or other gas, apparatus for, J. L. Faesch. Evaporator, F. S. Harman. Exhibiting case, J. M. Clapp. Farm gate, J. Bovee. Fence, J. Kinney. Fence barb former, wire, Poofer & Jones (r). Fence, portable, C. F. Bahnson. Fence, portable, J. M. Keller. Fertilizer distributers, feed cup for, W. Marks. Fertilizers, machine for disintegrating and drying, G. Mercer. Fire kindler, Hammer & Gretner. Fire service harness, R. Hudie. Flood gate, W. Donnan. Form, dress, J. Hall. Game, A. O. Hall. Game board, puzzle, C. J. Schumaker. Gas regulator, Merritt & Ford.	236,986 237,071 236,940 236,946 236,934 236,872 237,024 9,543 236,971 236,992 236,900 237,080 236,989 236,989 236,989 236,989 236,989 236,989 236,989 237,053 237,053	Tire tightener, J. R. Bell 23 Tool handle, I. W. Heysinger 23 Tool handle, H. B. Sherwood 23 Tool or implement, hand, E. T. Starr 23 Truss, L. Westinghouse 22 Turret, turret skylight, etc., G. Hayes 23 Vaginal dilating pipe, N. Mayer 23 Valve, balanced slide, J. B. Matthews 23 Valve, check, F. Lunkenheimer 23 Vegetables and fruit, apparatus for and process of drying, A. J. Emery 23 Vehicle spring, E. J. Moore 23 Vehicle spring, H. G. Steenburgh 23 Vehicle spring, J. Tilton (r) 23 Watch case opener, Heyse & Tuerlingx 23 Watch closet, H. C. Meyer 23 Water closet, C. H. Moore 23 Water elovator, W. A. & R. T. Smith 23 Whiffletree and double tree, R. W. Davis 33 Wind motor, turbine, M. De La Torre 23
T. & J. Cochran Electro-magnetic brake, Walter, Duwelins, & Merrell. Evaporating solutions in contact with air or other gas, apparatus for, J. L. Faesch. Evaporator, F. S. Harman. Exhibiting case, J. M. Clapp Farm gate, J. Bovee. Fence, J. Kinney. Fence bart former, wire, Pooler & Jones (r). Fence, portable, G. F. Bahnson. Fence, portable, J. M. Keller. Fertilizer distributers, feed cup for, W. Marks Fertilizers, machine for disintegrating and drying, G. Mercer. Fire kindler, Hammer & Gremer. Fire service harness, R. Hudle. Flood gate, W. Donnan. Form, dress, J. Hall. Game, A. O. Hall. Game, A. O. Hall. Game board, puzzle, C. J. Schumaker.	236,986 237,071 236,940 236,946 236,934 236,872 237,024 9,543 236,971 236,991 236,990 237,080 237,080 237,080 237,080 236,952 236,998 236,952 236,952 237,053 237,053 237,053	Tire tightener, J. R. Bell 23 Tool handle, I. W. Heysinger 22 Tool or implement, hand, E. T. Starr 23 Tool or implement, hand, E. T. Starr 23 Truss, L. Westinghouse 23 Turret, turret skylight, etc., G. Hayes 23 Undervest, J. L. Copp 23 Vaginal dilating pipe, N. Mayer 23 Valve, balanced slide, J. B. Matthews 23 Valve, check, F. Lunkenheimer 23 Vegetables and fruit, apparatus for and process of drying, A. J. Emery 23 vehicle spring, E. J. Moore 23 Vehicle spring, H. G. Steenburgh 23 Vehicle spring, J. Tilton (r) 23 Watch case opener, Heyse & Tuerlingx 23 Watch key, A. N. Clark 23 Water closet, C. H. Moore 23 Water closet, C. H. Moore 23 Water elevator, W. A. & R. T. Smith 23 Whiffletree and double tree, R. W. Davis 36 Windows, dust and wind guard for, R. M. Brundige 23
T. & J. Cochran Electro-magnetic brake, Walter, Duwelins, & Merrell. Evaporating solutions in contact with air or other gas, apparatus for, J. L. Faesch. Evaporator, F. S. Harman. Exhibiting case, J. M. Clapp Farm gate, J. Bovee. Fence, J. Kinney. Fence bart former, wire, Pooler & Jones (r). Fence, portable, C. F. Bahnson. Fence, portable, J. M. Keller. Fertilizer distributers, feed cup for, W. Marks Fertilizers, machine for disintegrating and drying, G. Mercer. Fire kindler, Hammer & Grehner. Fire service harness, R. Hudle. Flood gate, W. Donnan. Form, dress, J. Hall. Game, A. O. Hall. Game, A. O. Hall. Gas regulator, Merritt & Ford. Gas retort lid, W. J. Dooley, Glove, O. Guittard. Grain binder, J. F. Steward.	236,986 237,071 236,940 236,946 236,946 236,872 237,024 9,543 236,971 236,992 237,080 237,080 237,080 236,989 236,982 236,992 236,998 237,012 237,034 236,999 237,014 237,014 237,014	Tire tightener, J. R. Bell 23 Tool handle, I. W. Heysinger 23 Tool handle, H. B. Sherwood 23 Tool or implement, hand, E. T. Starr 23 Truss, L. Westinghouse 22 Turret, turret skylight, etc., G. Hayes 23 Vaginal dilating pipe, N. Mayer 23 Valve, balanced slide, J. B. Matthews 23 Valve, check, F. Lunkenheimer 23 Vegetables and fruit, apparatus for and process of drying, A. J. Emery 23 Vehicle spring, E. J. Moore 23 Vehicle spring, H. G. Steenburgh 23 Vehicle spring, J. Tilton (r) 23 Watch case opener, Heyse & Tuerlingx 23 Watch case opener, Heyse & Tuerlingx 23 Water closet, H. C. Meyer 23 Water closet, C. H. Moore 23 Water elevator, W. A. & R. T. Smith 23 Whiffletree and double tree, R. W. Davis 33 Wind motor, turbine, M. De La Torre 23 Windows, dust and wind guard for, R. M. Brundige 23 Wood bending machine, E. L. Buckingham 23
T. & J. Cochran Electro-magnetic brake, Walter, Duwelins, & Merrell. Evaporating solutions in contact with air or other gas, apparatus for, J. L. Faesch Evaporator, F. S. Harman Exhibiting case, J. M. Clapp. Farm gate, J. Bovee. Fence, J. Kinney. Fence barb former, wire, Poofer & Jones (r). Fence portable, C. F. Bahnson Fertilizer distributers, feed cup for, W. Marks. Fertilizers, machine for disintegrating and drying, G. Mercer. Fire kindler, Hammer & Greher. Fire service harness, R. Hudle. Flood gate, W. Donnan. Form, dress, J. Hall. Game, A. O. Hall. Game board, puzzle, C. J. Schumaker. Gas regulator, Merritt & Ford. Gas retort lid, W. J. Dooley, Glove, O. Guittard. Grain binder, J. F. Steward. Grain drill. Elam & Boggs.	236,986 237,071 236,940 236,946 236,934 236,872 237,024 9,543 236,971 236,971 236,991 236,992 236,992 236,998 236,952 237,063 237,063 237,063 237,063 237,063 237,063 237,063 237,063 237,063 237,063 237,063 237,063	Tire tightener, J. R. Bell 23 Tool handle, I. W. Heysinger 22 Tool or implement, hand, E. T. Starr 23 Tool or implement, hand, E. T. Starr 23 Truss, L. Westinghouse 23 Turret, turret skylight, etc., G. Hayes 23 Undervest, J. L. Copp 23 Vaginal dilating pipe, N. Mayer 23 Valve, balanced slide, J. B. Matthews 23 Valve, check, F. Lunkenheimer 23 Vegetables and fruit, apparatus for and process of drying, A. J. Emery 23 vehicle spring, E. J. Moore 23 Vehicle spring, H. G. Steenburgh 23 Vehicle spring, J. Tilton (r) 23 Watch case opener, Heyse & Tuerlingx 23 Watch key, A. N. Clark 23 Water closet, C. H. Moore 23 Water closet, C. H. Moore 23 Water elevator, W. A. & R. T. Smith 23 Whiffletree and double tree, R. W. Davis 36 Windows, dust and wind guard for, R. M. Brundige 23
T. & J. Cochran Electro-magnetic brake, Walter, Duwelins, & Merrell. Evaporating solutions in contact with air or other gas, apparatus for, J. L. Faesch. Evaporator, F. S. Harman Exhibiting case, J. M. Clapp Farm gate, J. Bovee. Fence, J. Kinney. Fence barb former, wire, Pooler & Jones (r). Fence, portable, C. F. Bahnson Fence, portable, J. M. Keller. Fertilizer distributers, feed cup for, W. Marks. Fertilizers, machine for disintegrating and drying, G. Mercer. Fire kindler, Hammer & Gretner. Fire service harness, R. Hudle. Flood gate, W. Donnan. Form, dress, J. Hall Game board, puzzle, C. J. Schumaker Gas regulator, Merritt & Ford. Gas retort lid, W. J. Dooley, Glove, O. Guittard. Grain binder, J. F. Steward. Grain drill. Elam & Boggs. Grain drill. Elam & Boggs. Grain drill cleaner, D. J. Shults.	236,986 237,071 236,940 236,940 236,934 236,872 237,024 9,543 236,971 236,992 237,080 237,080 237,080 237,080 237,080 237,080 237,080 237,080 237,080 237,080 237,080 237,080 237,080	Tire tightener, J. R. Bell 23 Tool handle, I. W. Heysinger 23 Tool or landle, H. B. Sherwood 23 Tool or implement, hand, E. T. Starr 23 Truss, L. Westinghouse 22 Turret, turret skylight, etc., G. Hayes 23 Undervest, J. L. Copp 23 Vaginal dilating pipe, N. Mayer 23 Valve, balanced slide, J. B. Matthews 23 Valve, beck, F. Lunkenheimer 23 Vegetables and fruit, apparatus for and process of drying, A. J. Emery 23 Vehicle spring, E. J. Moore 23 Vehicle spring, H. G. Steenburgh 23 Vehicle spring, J. Tilton (r) 24 Watch case opener, Heyse & Tuerlingx 23 Watch key, A. N. Clark 23 Water closet, C. H. Moore 23 Water closet, C. H. Moore 23 Water closet, C. H. Moore 23 Water elevator, W. A. & R. T. Smith 23 Windows, dust and wind guard for, R. M. Brundige 23 Wood bending machine, E. L. Buckingham 23 Wood borders, making, G. C. Setchell 23
T. & J. Cochran Electro-magnetic brake, Walter, Duwelins, & Merrell. Evaporating solutions in contact with air or other gas, apparatus for, J. L. Faesch. Evaporator, F. S. Harman. Exhibiting case, J. M. Clapp Farm gate, J. Bovee. Fence, J. Kinney. Fence bart former, wire, Pooler & Jones (r). Fence, portable, C. F. Bahnson. Fence, portable, J. M. Keller. Fertilizer distributers, feed cup for, W. Marks. Fertilizers, machine for disintegrating and drying. G. Mercer. Fire kindler, Hammer & Grehner. Fire service harness, R. Hudle. Flood gate, W. Donnan. Form, dress, J. Hall. Game, A. O. Hall. Game, A. O. Hall. Gas regulator, Merritt & Ford. Gas retort lid, W. J. Dooley, Glove, O. Guittard. Grain binder, J. F. Steward. Grain drill, Elam & Boggs.	236,986 237,071 236,940 236,946 236,934 236,872 237,024 9,543 236,971 236,992 237,080 237,080 237,080 237,080 237,083 237,012 237,063 237,013 237,064 237,064 237,061 237,064 237,065	Tire tightener, J. R. Bell
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T. & J. Cochran Electro-magnetic brake, Walter, Duwelins, & Merrell. Evaporating solutions in contact with air or other gas, apparatus for, J. L. Faesch Evaporator, F. S. Harman Exhibiting case, J. M. Clapp. Farm gate, J. Bovee. Fence, J. Kinney. Fence barb former, wire, Pooler & Jones (r). Fence, portable, C. F. Bahnson Fence, portable, G. F. Bahnson Fertilizer distributers, feed cup for, W. Marks. Fertilizers, machine for disintegrating and drying, G. Mercer. Fire kindler, Hammer & Gremer. Fire service harness, R. Hudle. Flood gate, W. Donnan. Form, dress, J. Hall. Game, A. O. Hall. Game board, puzzle, C. J. Schumaker. Gas regulator, Merritt & Ford. Gas retort lid, W. J. Dooley, Glove, O. Guittard. Grain binder, J. F. Steward. Grain drill, Elam & Boggs. Grain drill cleaner, D. J. Shults. Grate bar, Stevens & Borthwick Grate bar, C. W. Withenbury. Griddle, cake, S. C. Schofield. Grinding mill, T. Michaut. Halter, Mauk & Perry. Harrow and cultivator frame, flexible, B. Bannister Harvester binder, S. D. Locke. Hat block and chuck, G. F. Larkin.	236,986 237,071 236,940 236,946 236,934 236,872 237,024 9,543 236,971 236,960 237,080 237,080 237,080 236,952 236,952 236,952 236,952 237,063	Tire tightener, J. R. Bell
T. & J. Cochran Electro-magnetic brake, Walter, Duwelins, & Merrell. Evaporating solutions in contact with air or other gas, apparatus for, J. L. Faesch. Evaporator, F. S. Harman Exhibiting case, J. M. Clapp. Farm gate, J. Bövee. Fence, J. Kinney. Fence barb former, wire, Pooler & Jones (r). Fence, portable, C. F. Bahnson Fence, portable, J. M. Keller. Fertilizer distributers, feed cup for, W. Marks. Fertilizers, machine for disintegrating and drying, G. Mercer. Fire kindler, Hammer & Grether. Fire service harness, R. Hudle. Flood gate, W. Donnan. Form, dress, J. Hall. Game board, puzzle, C. J. Schumaker Gas regulator, Merritt & Ford. Gas retort lid, W. J. Dooley. Glove, O. Guittard. Grain drill. Elam & Boggs. Grain drill. Elam & Boggs. Grate bar, C. W. Withenbury. Griddle, cake, S. C. Schofield. Grinding mill, T. Michaut. Halter, Mauk & Perry. Harrow and cultivator frame, flexible, B. Bannister. Harvester binder, S. D. Locke. Hat block and chuke, G. F. Larkin. Hat pressing machine, Tyrrell & Kearns	236,986 237,071 236,940 236,940 236,934 236,872 237,024 9,543 236,971 236,992 237,080	Tire tightener, J. R. Bell
T. & J. Cochran Electro-magnetic brake, Walter, Duwelins, & Merrell. Evaporating solutions in contact with air or other gas, apparatus for, J. L. Faesch. Evaporator, F. S. Harman. Exhibiting case, J. M. Clapp. Farm gate, J. Bovee. Fence, J. Kinney. Fence bart former, wire, Pooler & Jones (r). Fence, portable, C. F. Bahnson Fence, portable, I. M. Keller. Fertilizer distributers, feed cup for, W. Marks. Fertilizers, machine for disintegrating and drying, G. Mercer. Fire kindler, Hammer & Gremer. Fire service harness, R. Hudie. Flood gate, W. Donnan. Form, dress, J. Hall. Game, A. O. Hall. Game board, puzzle, C. J. Schumaker. Gas regulator, Merritt & Ford. Gas retort lid, W. J. Dooley. Glove, O. Guittard. Grain binder, J. F. Steward. Grain drill. Elam & Boggs. Grain drill. Elam & Boggs. Grain drill cleaner, D. J. Shults. Grate bar, Stevens & Borthwick. Grate bar, C. W. Withenbury. Griddle, cake, S. C. Schoffield. Grinding mill. T. Michaut. Halter, Mauk & Perry. Harrow and cultivator frame, flexible, B. Bannister. Hat pressing machine, Tyrrell & Kearns. Hats. machine for finishing felt, House & Wheeler	236,986 237,071 236,940 236,940 236,934 236,872 237,024 236,971 236,971 236,971 236,971 236,990 237,080 237,080 237,080 237,080 237,080 237,080 237,081 237,063 237,063 237,063 237,063 237,063 237,063 237,063 237,063 237,063 237,063 237,063 237,063 237,063 237,063 237,063 237,063 237,063	Tire tightener, J. R. Bell
T. & J. Cochran Electro-magnetic brake, Walter, Duwelins, & Merrell Evaporating solutions in contact with air or other gas, apparatus for, J. L. Faesch Evaporator, F. S. Harman Exhibiting case, J. M. Clapp Farm gate, J. Bovee Fence, J. Kinney Fence barb former, wire, Poofer & Jones (r) Fence, portable, C. F. Bahnson Fence, portable, J. M. Keller Fertilizer distributers, feed cup for, W. Marks Fertilizers, machine for disintegrating and drying, G. Mercer Fire kindler, Hammer & Greiner Fire kindler, Hammer & Greiner Fire service harness, R. Hudie Flood gate. W. Donnan Form, dress, J. Hall Game board, puzzle, C. J. Schumaker Gas regulator, Merritt & Ford Gas regulator, Merritt & Ford Gas redulil. Elam & Boggs Grain drill. Elam & Boggs Grain drill. Elam & Boggs Grate bar, Stevens & Borthwick Grate bar, C. W. Withenbury Griddle, cake, S. C. Schoffield Grinding mill. T. Michaut Halter, Mauk & Perry Harrow and cultivator frame, flexible, B. Bannister Harvester binder, S. D. Locke Hat pressing machine, Tyrrell & Kearns Hats, machine for finishing felt, House & Wheeler Hay loader and raker. D. W. Bovee Heat from gas, apparatus for obtaining. Allen &	236,986 237,071 236,940 236,940 236,934 236,872 237,024 9,543 236,971 236,990 237,080 238,987 237,080 238,987	Tire tightener, J. R. Bell
T. & J. Cochran Electro-magnetic brake, Walter, Duwelins, & Merrell Evaporating solutions in contact with air or other gas, apparatus for, J. L. Faesch Evaporator, F. S. Harman Exhibiting case, J. M. Clapp Farm gate, J. Bovee Fence, J. Kinney Fence barb former, wire, Poofer & Jones (r) Fence, portable, C. F. Bahnson Ferce, portable, G. F. Bahnson Fertilizer distributers, feed cup for, W. Marks Fertilizers, machine for disintegrating and drying, G. Mercer Fire kindler, Hammer & Gremer Fire kindler, Hammer & Gremer Fire service harness, R. Hudle Flood gate, W. Donnan Form, dress, J. Hall Game, A. O. Hall Game board, puzzle, C. J. Schumaker Gas regulator, Merritt & Ford. Gas retort lid, W. J. Dooley, Glove, O. Guittard Grain binder, J. F. Steward Grain drill. Elam & Boggs Grain drill. Elam & Boggs Grain drill. Elam & Boggs Grain drill. Caner, D. J. Shuhs Grate bar, Stevens & Borthwick Grate bar, C. W. Withenbury Griddle, cake, S. C. Schofield Grinding mill. T. Michaut Halter, Mauk & Perry Harrow and cultivator frame, flexible, B. Bannister Harvester binder, S. D. Locke Hat block and chuck, G. F. Larkin Hat pressing machine, Tyrrell & Kearns Hats, machine for finishing felt, House & Wheeler Hay loader and raker. D. W. Bovee	236,986 237,071 236,940 236,946 236,946 236,934 236,872 237,024 9,543 236,971 236,972 237,080 237,081 237,081 237,084 237,081 237,084 237,081 237,084 237,081 237,084 237,087 237,087 237,087 237,087 237,087 237,087 237,087 237,087 237,087 237,087 237,087	Tire tightener, J. R. Bell

Horseshoe nail plate, J. M. Laughlin. 237,030 Hydraulic apparatus, E. Bellingrath. 236,871

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	Incubator heat regulator, F. Meyer	237,03 6 237,03 8
	Journal box, J. H. Allen	236,868
	Journal box, lubricating, G. W. Fisher Knitting and other light machines by power, driv-	
	ing, W. H. Caswell	236.932
	Lamp, J. M. Dexter	237,048
	Lighting and extinguishing device, W.D.Doremus Liquid cooler, M. F. Capps	236,939
	Loom, Crompton & Wyman	236,990
١	Loom, Dawsell, Myers, & Smith	237,059
	Miter machine, J. R. Bodeli	236,978
	versing, C. M. Fairbanks	
	Nail plate feeder, E. C. Taylor	236,966 236,904
	Optometer, F. Scharpf	236,911 286,987
	Paint, J. F. Hoffman	237.017
	Paint, mineral, D. E. Goodell	236,835
		236,951
	regulator for, R. Hutton	
	Pen, fountain, J. S. Purdy Pen, stylographic fountain, C. H. Downes	
	Pencil, B. A. Fiske	237,005
		236,916
	Pipe coupling, G. F. Ott	236,957 236,914
	Planter, hand corn, W. L. Sebring	
	Plow carriage, O. E. Goodell	237,010
	Plows, revolving harrow attachment for, Kennedy, Preston, Morand, & Kennedy	
	Printing press, J. Till	237,067
	Pump bucket, reversible chain, W. P. Harrison	236,947
	Pump, force, P. Breidenbach	236,956
	Rail joint, J. Peck	236.883
	Razor guard, P. L. Fontaine Refrigerating butter box, Mosler & Ladewig	236,906
	Rock drill bar, H. W. Hammond	
	Rowing apparatus, boat, E. Heyde	226 922
	Saddle, harness, Glover & Smith	236,944
	Sample exhibiting stand, W. P. Yeoman	286,969
	Saw handle, J. R. Woodrough	236,925
	Saw set, A. Rush	237,049
	Scarf, neck, T. J. Flagg Scarf ring, B. F. Brown	236,874
	Screw driver, N. Stow	
	Sewer trap, H. Textor	236,938
i	Sewing machine, J. F. & W. F. Webster Smoke consuming furnace, C. Smith	
	Soap for toilet purposes, liquid pond lily, F. & G. W. Wright	
	Soldering iron, C. E. Ball	
	Sole trimming knife, W. R. Barton	
	Spinning machine flier, J. F. Fess	236,942
1	Stamp, canceling, L. Tilton	237,068 236,960
	Station indicator, automatic, H. E. Bissell	236,977
i	Steam generator, G. B. N. Tower Stirrup, I. Hillen	236.920
1	Stove, S. Shepard	236,961
	Stovepipe thimble and cover, M. B. Scribner 2	236,912
	Tag, A.N. Clark	237,007
•	Tea and coffee pot, J. B. Daniel	237,043
•	Felephonic receiving apparatus, C. A. Randall Fire tightener, J. R. Bell	36,870
•	Fool handle, I. W. Heysinger 2 Fool handle, H. B. Sherwood 2	37,056
	Fruss, L. Westinghouse	
	Furret, turret skylight, etc., G. Hayes. 2 Undervest, J. L. Copp. 2	
١	Vaginal dilating pipe, N. Mayer	37,032
١	Valve, check, F. Lunkenheimer	
	of drying, A. J. Emery	
١	Vehicle spring, H. G. Steenburgh 2	
١	Vehicle spring, J. Tilton (r)	36,927
١	Watch case opener, Heyse & Tuerlingx	36,984
	Vater closet, H. C. Meyer	
Ų	Water elevator, W. A. & R. T. Smith	36,993
	Wind motor, turbine, M. De La Torre	
	dige	36,980
ı	Vood borders, making, G. C. Setchell	37.054
	DESIGNS.	10.1.5
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tobacco, and snuff, L. Wertheimer..... 8,152 English Patents Issued to Americans.

From January 21 to January 25, 1881, inclusive Axle bearings, J. E. Maynadier, Boston, Mass. Feed water heaters, J. H. Dane, San Francisco, Cal. ce machine, A. J. Rossi et al., New York city. India.rubber waste, restoration of, H. A. Clark, Boston.

Lawn mowers, Lloyd, Supplee & Walton, Phila., Pa. Ore separator. J. F. Halbrook et al., Palmer, Mas Vinegar, manuf. of, O. F. Boomer et al., Brooklyn, N. Y.