lar, in which shape the cigars are held y a practically rigid frame or band, which holds them in this position whether in or out of the box. The latter is triangular in form and has a base plate and one fixed end piece, the other end piece and two side pieces being hinged. A clasp holds the box closed, and by releasing it, one of the end pieces and the two side pieces may be let down and the cigars well exhibited.

DESIGN FOR A COLUMN. -- Amos A Fenn, Leavenworth, Kansas. This column is angular in form, with plane ends, intermediate of which the several faces have a special style of ornamental configuration.

Note.-Copies of any of the above patents will be furnished by Munn & Co., for 25 cents each. Please send name of the patentee, title of invention. and date of this paper.

NEW BOOKS AND PUBLICATIONS.

ALLEN'S NATURALIST'S LIBRARY. Edited by R. Bowdler Sharpe. (A) A HAND-BOOK TO THE MARSUPIALIA AND MONOTREMATA. By Richard Lydekker. (B) A HANDBOOK TO THE BIRDS OF GREAT BRITAIN. By R. Bowdler Sharpe. London: W. H Allen & Co., Limited. 1894. Pp xvii, 302, and pp. xix, 342. Price \$240 each.

These beautiful volumes, the illustrations all being in colors and exceedingly numerous, cannot be adequately reviewed by us. The one on birds contains over thirty beautiful plates relating to ornithology and oology. The one on marsupials and monotremes, treating of the curious animals of Australia and their relatives in other parts of the world, has thirty-eight plates of the same description. The illustrations of the kangaroo and the wallaby alone will be found of especial interest. There are other volumes to follow, and a most valuable series will be the result. The volumes remind us of the old time and widely popular "Naturalist's Library," to which it is a

WATER OR HYDRAULIC MOTORS. By Philip R. Bjorling. London: E. & F. N. Spon. New York: Spon & Chamberlain. 1894. Pp. xii, 287. With 208 illustrations. Price \$3.50.

The different types of hy raulic motors, from the old fashioned water wheel to the modern turbine, reciprocating and oscillating engines and hydraulic rams, are the subject of this work, which not only describes these different classes of machines with adequate illustrations, but treats of measurement of water and of general hydraulics. It has an excellent table of contents, both of the matter and the illustrations, and an index.

MECHANICAL DRAWING. Projection Drawing; Isometric and Oblique
Drawing, Working Drawings. A
condensed text for class room use.
By Walter K. Palmer. Columbus,
Ohio: Charles B. Palmer. Price 80

When a young man finds that he can draw, he is apt to consider himself a draughtsman, while he may be ignorant of the manipulation of instruments and appliances. There are definite mathematics in drawing, and this little work, designed for the use of teachers, develops the fundamental points which should be under stood by a draughtsman, some of which are, doubtless, comparatively little studied.

TAN PILE JIM; OR, A YANKEE WAIF AMONG THE BLUENOSES. By B. Freeman Ashley. Chicago: Laird & Lee. Pp. 259. Illustrated. Price cloth, \$1; boards, 50 cents.

This prettily printed and illustrated book gives a picture of life in the British provinces. The author evidently is of a humorous bent, and by means of numerous illustrations the text is fully illustrated.

THE WORK OF HERTZ AND SOME OF HIS SUCCESSORS. Being the Substance of a Lecture delivered at the Royal Institution. By Professor Oliver Lodge. London: The Electrician Printing and Publishing Company, Limited. Pp. 58. No contents, no index. Price \$1.

We are glad to find the classical researches of Hertz put into book form. The matter is largely experimental and is elaborately illustrated, so that it will be of more popular interest than the dry statement of the work otherwise would be. Unfortunately, it lacks both index and contents, either of which would add materially to its

ALTERNATING CURRENT WIRING AND DISTRIBUTION. By William Le Roy Emmet. New York: The Electrical Engineer. 1894. Pp. 76. No index. Price \$1.

We are very glad to see this little work. It will help electricians to recognize the fact that there is more con cerned in the distribution of alternating currents of elec tricity than Ohm's law. The short table of contents of the book gives an excellent idea of its range of topics The omission of an index is, of course, something to be

ELECTROMAGNETIC THEORY. By Oliver Heaviside. Vol. I. London: The Electrician Printing and Publishing Company, Limited. 1893. Pp. xxi, 466. Price \$5.

Mr. Heaviside has won a fine reputation by his mathematical work on the theory and application of electricity. The title of this book states that it is on the electromag netic theory. The preface indicates that the author has a pretty good knowledge of human nature and appreciates, to say the least, his own value. His plea for the recognition and correct statement of electrical units is excellently put and makes really amusing reading. The of any Architectural Publication in the world. Sold by esprit of the author may be deduced from the title of one all newsdealers. MUNN & CO., Publishers. of the sections on "the nature of antimathematiclana,"

the introduction being divided into sections. His plea for mathematics is most amusingly and graphically put. We strongly recommend the book to aspiring electricians, and hope that it will induce many to take up the mathematics of the subject who otherwise would be content with its general treatment.

PHYSICAL LABORATORY MANUAL FOR USE IN SCHOOLS AND COLLEGES. By H. N. Chute. Boston, U. S. A.: D. C. Heath & Co. 1894. Pp. xvii, 213. Price 80 cents.

Harvard University has led the way in requiring of its applicants for admission the execution of a course of practical physics as one of its alternatives. This excellent little book describes such a course. Numerous illustrations are given, and the different topics in physics are excellently treated

PRACTICAL WORK IN GENERAL PHYSICS. For use in schools and colleges. By W. G. Woollcombe. Oxford: At the Clarendon Press. 1894. Pp. xii, 83. Price 75 cents.

Two of a Trade. By Martha McCullough Williams. New York: J. Selwin Tait & Sons. 1894. Pp. 206. Price, cloth, \$1.

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SCIENTIFIC AMERICAN

BUILDING EDITION OCTOBER, 1894.-(No. 108.)

TABLE OF CONTENTS.

- 1. Elegant plate in colors showing a Colonial residence at Plainfield, N. J., recently erected for B. A. Hegeman, Jr. Two perspective elevations and floor plans, also an interior view. Cost \$6,000. A pic turesque design. Mr. Frank W. Beall, architect, New York City.
- 2. Plate in colors showing a very attractive stone dwelling recently erected for H. J. Peet, Esq., at Buena Park, Ill. Two perspective elevations and floor A pleasing design. Mr. J. L. Silsby, architect, Chicago, Ill.
- 3. A dwelling at Bridgeport, Conn., recently erected for Frank Fowler, Esq. Two perspective elevations and floor plans. Cost complete \$5,600. Mr. A. H. Beers, architect, Bridgeport, Conn.
- A cottage at Stratford, Conn., recently completed for Robert Wheeler, Esq. Perspective elevation and floor plan. A unique design presenting pleasing elevations and a well arranged Plan. \$6,200 complete. Mr. Edgar Osborne, builder,
- 5. The residence at Belle Haven, Conn., recently completed for J. E. Kent, Esq. An attractive design in the modern Colonial style. Two perspective elevations and floor plans. Cost \$6,850 complete. Messrs. Rossiter & Wright, architects, New York City.
- 6. A Colonial double house recently completed at Bayonne City, N. J. Perspective elevation and floor plans. Cost \$1,800. Mr. Arthur C. Longyear, architect, New York City.
- Adwelling at Bensonhurst, L. I., recently erected for John P. Jepson, Esq. An excellent example for a suburban home. Two perspective elevations and floor plans. Cost \$5,620 complete, ready for occupancy. Mr. William H. Mersereau, architect, New York City.
- A dwelling at Flatbush, L. I., recently completed for Richard Ficken. Esq. A design in the Colonial style. Two perspective elevations and floor plans. Messrs. J. C. Cady & Co., architects, New York
- 9. A small Colonial cottage at Bayonne City, N. J. Perspective elevation and floor plan. Cost complete, \$2,800. Mr. Arthur C. Longyear, architect, New
- all-the-vear-round residence.
- Raschdoff.
- 12. Roman remains at Bath, England.
- 13. The Temple of Neptune at Paestum. 14. Miscellaneous Contents: Mahogany payement.—Proportion in architecture.—The architect who never the English and American plumbers —Decay of etc., illustrated.—Double tenoning by machinery.— Transparent bricks for hothouses.—The Capital heater, illustrated.—The Poppert patent improved weight sliding blinds, illustrated.-The new decoration in the apse of St. Paul's.-Preparing walls for papering.-An improved carpenter's clamp, illustrated.-An improved sanitary appliance, illus-

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trated.-Hughes' improved drawing table, illus-

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Minerals sent for examination should be distinctly marked or labeled.

(6266) J. H. J., Shanghai, China, writes: Will you please tell me through the columns of the Scr-ENTIFIC AMERICAN how the rule for ascertaining the fall of the earth's surface for any given distance is obtained i The rule I believe is as follows: For the first mile a fall of eight inches; for other distances, multiply by the square of the distance in miles. A. The rule as stated by our correspondent is an approximate one only, and is derived from the formula of the United States engineers, viz., square of the distance in feet divided by the earth's equatorial diameter in feet equals the amount of curvature in feet. This being for curvature alone, a correction for refraction must be made, making the

formula (1–2m) $\frac{D^2}{2R}$ in which D=distance in feet, 2 R=

twice the earth's radius in feet, and m=0.075 in feet.

(6267) F. M., Kansas, writes: I am desirous of digging a well. I have already made three attempts and failed in each case. The circumstances are these. At the depth of about 17 feet there is a 6 foot layer of sand and gravel, the first two feet of which appears to be quicksand, the remaining 4 feet coarse sand and gravel, after which comes blue clay. We attempted to drive a wooden curb as we dug, but as York City. fastas we removed the sand inside the curb it would 10. A residence at Pompton, N. J., built for Wm. F. fill in from underneath. The water also bothered confast as we removed the sand inside the curb it would Hall, Esq. Cost, \$7,500. A good example of an siderably; we tried pumping it out, but after an hour's pumping, the sand would wear the leathers in the pump, 11. The new Protestant Cathedral at Berlin, Germany, so that it would cease to act, and as before stated, we costing \$2,400,000. Designed by Prof. Julius had to abandon the attempt. Some parties advise me to have a brick and cement wall built on a circular wooden frame, the same to be sunk as sand is removed but I cannot see why this should prevent sand coming in underneath any better than the wooden curb. Also how can the water be kept out of the way while removing exceeded estimates.—Some difference between the sand? Advice on the above matter will be greatly appreciated. A. An oak cage curb is the proper guard stone.—Wood water main.—Artificial marble.— protecting the operation of laying the foundation of your Art mouldings, illustrated.—Snowguards for roofs, stone curb. This may be made of a ring of oak plank cut in segments and lapped to complete two layers for stiffness, also a narrow ring of pine for the top, to be removed when the stone curb reaches it in building. On the outside nail 116 inch oak strips 5 or 6 feet long, ac cording to depth it is desired to sink the curb below the water line, the strips nearly touching each other to make a strong but not tight curb. Place the wooden curb at the bottom on the water line and build up the stone curb, resting upon the bottom wooden ring as tight as possible without cement and so that the stone work will form a resisting arch circularly against the earth pressure, care being taken to protect the well from an earth cave from the water line to the top by praced sheeting of boards. When the stone curb is finished to the top ring, the work of excavating may be done by abovel as far as the water will allow without pumping.

A strip the work of excavating may be done by abovel as far as the water will allow without pumping.

A strip the strips nearly touching each other to make a strong but not tight curb, and supplies of 3. T. Eldridge.

527,363

A recontinue the strips nearly touching each other to make a strong but not tight curb. Agricultural machine, convertible, S. J. Conk-wright.

527,363

A recontinue the stone curb is finished to the top ring, the work of excavating may be done by abovel as far as the water will allow without pumping.

527,061

A recontinue the strips nearly touching each other to make a strong but not tight curb. Services for train 527,363

Are continued to be strip to the stone curb is finished to the top ring, the work of excavating may be done by abovel as far as the water will allow without pumping.

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A recontinued the strip to the stone curb is finished to the top ring, the work of excavating may be done by a strip the strip to the strip to the strip.

527,062

A rele box. roller bearing, J. D. Mattison.

527,063 Axleage sand auger should then be used to continue the taking out of the sand evenly all around the inner edge of the curb to allow it to settle level. Any disposition to tilt may be counteracted by excavating at the high side only. No water should be taken out other than contained in the sand in the auger. A sand auger may be made by any sheet iron worker, from No. 16 iron, by

making a cylinder about 9 inches in diameter and no higher than 9 inches, as that is about the depth of sand that can be taken in at one operation. The bottom of the cylinder to be fitted with lips like an auger, but extending around and just overlapping, with an opening from the center to a depth of one inch at the outer part. A strong forked iron stem about 6 feet long with an eye at the top for a wooden handle will complete the auger. Then by screwing the auger into the sand, with a little manipulation like handling a post auger, which by the way will make a good sand auger with a sheet iron guard pipe to keep the sand from washing off. In this way of excavating without removing the water the curb may be settled down to the desired depth. After arriving at the layer of coarse sand, if the curb sticks by the packing of the sand, a pole or rod of iron may be thrust under the lower edge of the curb ring to loosen it, or by removing the upper cage ring the stone curb may be carried up to increase the weight. In this manner by careful management substantial well curbs may be sunk to considerable depth in water-bearing quicksands and gravel.

(6268) N. C. F. asks: Will you kindly give me the true explanation of the reason why a sheet iron heater placed over a kerosene lamp will heat a room better than the lamp will without the heater over it, and , why the same flame inside of a sheet iron drum in the form of a gas stove will give more heat than the same flame without a stove over it? A. There is no absolute increase of heat orof heat units by the use of the iron drums as stated; but there is something in the susceptibility of the nerves to the effect of low radiant heat from enlarged metal surfaces, nor is the phenomenon confined to metal alone, as attested in our boyhood, when we enjoyed the low radiant heat from the sunny side of a barn in the cool autumn weather. The radiant heat from the lamp diverges in all directions, and only the area of the body intercepts it, while the extended surface of a sheet iron drum intercepts and converts the entire divergent radiant heat into convergent radiant heat from a large surface, and its effect upon the nerves is to make us feel warm without an actual increase of heat energy from the

(6269) A. P. H. S. asks for a formula for treating wood patterns to give them the smooth black appearance. I have tried a number of paints and pigments, but thus far have been unable to find anything that will answer. A. Stir refined lampblack into brown shellac varnish until it contains enough of the pigment to cover well. Strain through cotton cloth. Apply two coats. After the first coat is dry rub down with fine sand paper or with emery paper. After the second coat is dry rub with hair cloth or a bunch of horse hair, and finally apply a thin coat of brown shellac with a camel's

(6270) L. H. E., Kansas, says: On September 20, at 6:30 o'clock in the morning, the sunshines in a tunnel, or if you were to stand at one end and look through you could see the sun at the day and hour mentioned. What is the per cent of the grade of the tunnel and how do you get it? A. On Sept mber 20 the sun is on or near the equatorial plane, and for the assumed latitude of 40° north the sun's path is inclined 50° from the plane of the horizon at sunrise. At that date it rises about 14 minutes before 6, which added to the time of observation, makes it 44 minutes on its course from the horizon. Then 44'x by the cosine of the latitude=33.7', the vertical altitude. As 4 time minutes are equal to 1

33.7′ =8.42 degrees, to which should be added 0.11° degree 4

for refraction at that altitude, making 8.53 or 8° 31', the sine of which is 0.148, or nearly 15 per cent as the grade of the tunnel.

Communications Received.

- "The Bronze Age in Europe." By W. H. K.
- "On Flying." By D. G. E.
 "On the Moon." By H. W. E.
 "On Bird's Eye Maple." By W. J. B.
- "Astronomy as It Is." By H. C.
- "A Submerged Atmosphere." By A. E. R. "On a Remedy for Red Ants." By J. E. B.
- "On Phenomena of Regeneration." By E. K.

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INDEX OF INVENTIONS

For which Letters Patent of the

October 9, 1894,

AND EACH BEARING THAT DATE.

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

254	Scientitic	E
Beam, fireproof, Balph & Wright. 527,232 Bearing, ball, W. Badger 527,041 Beer, means for transporting, V. Oppl. 527,134 Beer, means for transporting, V. Oppl. 527,136 Belt shipper, L. Armanni 527,130 Bicycle, Whitzker & Lyon 527,336 Bicycle pedal, C. H. Davids. 527,335 Bicycle pedal, Scognamillo & Dominici. 527,349 Bicycle wheels, manufact uring metallic rims for, C. H. Pugh. 527,345 Bicycle wheels, manufact uring metallic rims for, C. H. Pugh. 527,345 Bicycle wheels, manufact uring metallic rims for, C. H. Pugh. 527,345 Boller. See Water tube boiler. 527,345 Boller. See Water tube boiler. 527,345 Boller. H. H. Kelley. 527,345 Boller support and wall steam, G. A. Crane 527,165 Book, ancestral record, F. W. Bailey 527,361 Book holder, index, and writing tablet, combined. C. F. Johnson. 527,141 Boots or shoes, machine for splitting insoles for, F. L. Stone. 527,289 Bottle capping machine, F. M. Leavitt. 527,289 Bottle capping machine, F. M. Leavitt. 527,289 Bottle, nursing, H. Hertmann. 527,343	Insulator, E. J. Bullock	V
Beer, means for transporting, V. Oppl. 527.123 Belt shipner, L. Armanni 527.130 Bicycle, Whitaker & Lyon 527.396 Bicycle, 1 C. Ziegler 527.135	Insulator, E. J. Bullock	,
Bicycle Pedal, C. H. Davids	joint. Stovepipe joint. Key register, W. H. Thompson	7
Boiler, See Water tube boiler. 527.337 Boiler, H. H. Kelley 527.337 Boiler setting, steam, W. W. Burk 527.106	Knife. See Bread or cake knife. 527,113 Knitting machine, 8, Jaros. 527,213 Lamp, electric arc. M. Mayer. 527,221	7
Boiler support and wall, steam, G. A. Crane	Lamp, electric arc, J. E. Woolverton	7
Boots or shoes, machine for splitting insoles for, F. L. Stone	Kitchen table, F. E. Van Houten	ļ
Bottle capping machine, F. M. Deavitt. 227,284 Bottle or vessel holding device, F. G. Kammerer. 227,334 Bottle stopper, C. B. Schoenmehl. 527,161 Box corner binder, A. A. Wood. 527,803 Box fastener, E. A. Beck. 527,843 Box lid holder, W. Fowler. 527,274 Boxes or plates, machine for manufacturing, M. Eachenbeck. 527,146	Lock, G. Brust & al. 527,106 Lock, G. Brust & al. 527,244	E
Box corner binder, A. A. Wood. 527,308 Box fastener, E. A. Beck. 527,443 Box lid bolder, W. W. Fowler. 527,274 Boxes or plates machine for manufacturing. M.	Locomotion on railways, electric, J. J. Hellmann. 527,244 Locomotive, electric, N. J. Raffard. 527,126 Loom beddle, H. Vogelsang. 527,165 Loom sbedding mechanism, H. Wenzel. 527,033 Magnets of dynamo-electric machines or motors.	F
Boxes or plates, machine for manufacturing, M. Eschenbeck	Loom shedding mechanism, H. Wenzel. 527,093 Magnets of dynamo-electric machines or motors, adjuster for field. M. Waddell. 527,225 Marker, land. S. J. Conkwright. 527,322 Mast noop. W. R. Baker. 527,167 Mats floors, etc., wearing surface for door, H. D. Whiteley. 527,094 Mattress. G. S. Perren. 527,194 Measure, tape. F. L. Church. 527,194 Metal, machine for cutting beveled edges on plate, D. Lennox. 527,178 Metals, method of and apparatus for electro deposition of, C. R. Fletcher. 527,110 Meter. See Water meter. 527,245	ŝ
Brake shoe, vehide, H. F. Snephard 321,328 Bread or cake knife, J. W. Hurd 527,175 Brick kiln, W. A. Wilford 527,255 Brushes manufacture of, J. Stauder 527,255	Mats, noors, etc., wearing survice 10 doc, H. B. 527,094 Whitteley 527,287 Measure, tape. F. L. Church 527,194	A
Buckle, suspender, W. L. Doran 527,170 Buggy top Prop. L. C. Pollard 527,183 Butchering apparatus, Cherry & Dysert 527,320 500,000 500,000 500,000	Metal, machine for cutting beveled edges on plate, D. Lennox	A
Cable support, E. G. P. Wern 527,306 Calking vessels, A. J. Brooks 527,169	Dosition Of C. R. Fietcher Dosition Of C.	Е
Can. Sec Milk can. 527.529 Canister, soap powder, B. R. Foster 527.529 Car coupling, G. Olmstead 527.326 Car coupling, H. Scheeffer 527.326 Car dumping safety device, J. L. Arter 527.136 Car dumping apparatus, railway, T. Long 527.117 Car life-saving guard, L. E. Dubois 527.270 Car mechanism for operating switches, street 527.282 Car seat, C. Wowra 527.282 Car spring buffer, street, H. A. Howe 527.282	Multing machine. E. J. McClellan 527,218 Moistening device, T. J. Close. 527,419 Motor. See Current motor. Steam motor. Music holder and stand, combined. J. Wunder. 527,086	: C
Car coupling safety dwylee, J. L. Arter. 527, 136 Car dumping apparatus, railway T. Long. 527, 136 Car life-saving guard, L. E. Dubols. 527,270	Musical instrument, J. Dodd	ှ မြ
Barber & Babbitt. 527.262 Car seat. C. Wowra 527.962 Car spring buffer, street. H. A. Howe 527,203	Nut lock, P. T. Johnston 527,390 Nut lock, T. J. Litzinger 522,179 Nut lock, W. W. Owens 527,154	F
Car ventilator, O. H. Goldberg 527,241 Cars, machine for moving railway, E. W. Ring-	Oil can carrier, J. H. Lins 527,538 Ore concentrator, A. C. Springer 527,228 Ornamenting machine, E. A. Marsh 527,246 Overshoe securer, O. R. Tower 527,086	N
Carburetor, Sprague & Guthrie 527.085 Carriage storm bood, top, A. W. Scidmore 527.085 Carriagest, p worker, A. C. & W. E. Bendler 577.314 Carriages, sled attachment for baby, C. J. Bong-	Ozone, producing, Donovan & Gardner	V
Cartridge holder, reloading, A. J. Watson. 527,166 Carving machine, W. Maybeek. 527,152	Paper stock, machine for breaking up strings or balls of, C. L. Hamilton	İ
Cash drawer and register, C. H. Shaw	Cramby. 27,031 Phosphorus, making, Shearer & Clapp. 527,163 Photographic burnisher. W. H. Boles. 527,155 Photographic head and body rest, W. M. Gilson. 527,048 Pick, M. Hardsoeg. 527,331 Pick, M. Hardsoeg. 527,331	1
Casket handle, 1s. H. Bannister 327,339 Castrating instrument, J. E. Anderson 527,309 Chimney cap and ventilator, W. Earle 527,109 Chiropodists' use, instrument for, F. M. Garles 527,240 Chuck, drill, J. H. Westcott 527,227 Circuit controller for regulators, B. B. Ward 527,032 Clement See Sign durph 527,032	Hand action, Clark & Morgan 327,936 Pick, M. Hardsocg 527,331 Pipe See Tobacco pipe. Pipe clamp. C. Hall 527,200	2020
Circuit controller for regulators, B. B. Ward	Pipe clamp, C. Hall. 527,200 Pitman connection, T. Regan 527,120 Planter ridging attachment, corn, L. Runyan 527,180 Pneumatic cash carrier apparatus, O. Ames 527,040	
Circuit controller for regulators, B. B. Ward.	Pneumatic dispatch tube systems, valve for, A. W. Pearsall 527,073 Pneumatic dispatch tube terminal, O. Ames. 527,039 Post or column. O. Andre. 527,310	1
of, J. Wolf, Jr. 527,364 Cloth holder, W. H. Cummings 527,064 Clutch, driving, M. C. Johnson 527,064	Post or column. O. Andre	1
Code bod. J. H. Humbert	Pruning tool, Kineretter & Nash. 527,116 Pulley, O. W. Ketchum 527,082 Pump, rotary, E. F. Smith 527,082	
Closson 527,139 Coffee or tea pot handle, O. W. Pierce. 527,139 Coffee or tea pot handle, O. W. Pierce. 527,139 Coff case, R. L. Chope. 527,266	Hail hender, II. W. Armstrong. 527,100 Railway aominicator, C. R. Alsop. 527,301 Railway conduit electric, J. E. Toole. 527,301 Railway conduit electric, J. E. Toole. 527,301	1 2 2
Combustator brush holder, G. Rauch 527,243 Commutator brush holder, G. Rauch 527,127 Coolor. See Wort cooler.	Railway, elevated, J. C. Des Granges. 527,236 Railway guard, Bates & Smith 577,132 Railway guard, Bates & Smith 577,132 Railway guard, Bates & Smith 527,332	ì
Corn husking machine, W. H. Webb. 527,226 Coupling. See Car Coupling, Thill coupling. Cull holder, W. M. Howe. 527,122	Railway rait joints, truss for, W. F. Dimmick. 527,138 Railway switch, E. H. B. Knowiton. 527,338 Railway switch, A. F. Schinner. 527,238 Railway switch, O. D. Willorer. 527,338	
Curling iron, C. H. Johnson 527,176 Gurrent motor, alternating, C. Coerper 327,186 Curtain frame, lace, M. V. Bonsall 327,316	Printing press inking apparatus, R. Miehle. 527,381 Propeller, screw. A. W. Case. 527,045 Pruning tool, Klinefetter & Nash. 527,045 Pulney, O. W. Ketchum 527,065 Pump, rotary, E. F. Smith. 527,085 Railway apminciator, C. R. Alsop 527,080 Railway, conduit electric, J. E. Toole. 527,307 Railway, conduit electric, J. E. Toole. 527,307 Railway guard, Bates & Smith 527,238 Railway rail foint, H. H. Fifield. 527,337 Railway rail joints, truss for, W. F. Dimmick. 527,338 Railway switch, E. H. E. Knowlton. 527,238 Railway switch, E. H. E. Knowlton. 527,238 Railway switch, T. D. Willever 527,338 Railway tack switch, electric, A. F. Schinner 527,238 Railway, system of electric-block signals for, W. 527,267	
Commutator brush holder, G. Rauch. 527,127 Coolor. See Wort cooler. Coordor. See Wort cooler. Corn husking machine. W. H. Webb. 527,226 Coupling. See Car Coupling. Thill coupling. Culf holder, W. M. Howe. 527,062 Curling iron, R. Friedel. 527,176 Curling iron, C. H. Johnson. 527,176 Curling iron, C. H. Johnson. 527,176 Curtain rame, lace. M. V. Bonsall. 527,136 Curtain frame, lace. M. V. Bonsall. 527,316 Cutter, See Stalk cutter. 527,316 Cutter, See Stalk cutter. 527,316 Desk and reading stand, knee, A. R. Cooper. 527,168 Dish cleaner, J. J. O'Neill. 527,122 Door bar lock, T. H. Benninger. 527,108 Door sterly, automatic, W. N. Morrison. 527,316 Drawing board, Van Hora & Banney. 527,132 Drawing board, Van Hora & Banney. 527,134 Drawing instrument, G. Thomas. 527,300 Drill. See Grain drill. Drill bits, etc., tool for bandling, J. Barrett. 527,301 Drill bits, etc., tool for bandling, J. Barrett. 527,301 Drill bits, etc., tool for bandling, J. Barrett. 527,301 Drill bits, etc., tool for bandling, J. Barrett. 527,302 Drill bits, etc., tool for bandling, J. Barrett. 527,302 Drill bits, etc., tool for bandling, J. Barrett. 527,302 Drill bits, etc., tool for bandling, J. Barrett. 527,302	Railway track switch, electric, A. F. Schinner Railways, system of electric block signals for, W M. Cuthbert Recorder. See Time recorder. Reed, Gooding & Gondey. Register. See Fareregister. Key register. Ring. See Clew ring. Earring. Sails, reefing, S. G. Martin. Sash bolder, J. Claypool. Sash seight, H. Marsball. Sash bolder, J. Claypool. Sash wisht, H. Marsball. Saw filing machine, J. N. Howard. Saw mills, variable gear for, J. T. Oberdorfer. Scale, price, O. O. Ozias. Scale, price and weighing, O. O. Ozias. Scale, price and weighing, O. O. Ozias. Seale, price and weighing, O. O. Ozias. Sewing machine, J. B. Price. Sewing machine, Sectrini & Cade. Sibate or globe holder. F. Rhind. Sheet metal, making expanded, J. F. Golding. Sipal recording device, W. H. Adkins. Signal recording device, W. H. Adkins. Signal recording device, W. H. Adkins. Skate, roller, J. A. Segerberg. Skate sharpening device, F. W. Taylor. Signal cording device, F. W. Taylor. Signal recording device, F. W. Taylor. Signal recording device, W. H. Adkins. Signal recording device, W. H. Adkins. Skate sharpening device, F. W. Taylor. Signal prodato, Struble & Turner. Scale pricato, Struble & Turner. Signal prodato, Struble & Turner. Signal prodato, Struble & Turner. Signal prodato, Struble & Turner. Signal machine, F. Scales, J. K. Griffith. Spoon, S. H. Kimball. Sprocket wheel, Murpby & Kolb. Stalk cutter, H. W. Allen. Stalk cutter, W. H. W. Allen. Stalk cutter, W. W. Allen. Stalk cutter, W. M. Allen. Stalk cutter, W. W. Allen. Stalk cutter, H. W. Allen. Stalk cutter, S. Scales and S. H. Leavenworth. Stale fastewer for wooden vessels or boxes. F. W. Richey. Steam engine, J. R. Pearce. Steam engine, J. R. Pearce. Stove. N. Lehmann. Stove. N. Lehmann. Stove. N. Lehmann.	
Dish cleaner, M. A. Crosby 527, 322 Dish cleaner, J. J. O'Neill 527, 122 Door bar lock, T. H. Benninger 527, 104	Salis, reefing, S. G. Martin 527,340 Sash boider, J. Claypool 527,137 Sash weight, H. Marshall 527,151	
Door check, E. Dredge 527,183 Door check, P. G. Emery 527,353 Door strip, automatic, W. N. Morrison 527,212 Draught consider 5 D. Poole 527,212	Saw filing machine, J. N. Howard 527,322 Saw mills, variable gear for, J. T. Oberdorfer 527,323 Scale, price, O. O. Ozlas 527,128 Scale, price and weighing () O. Ozlas 527,128	
Drawing hoard, Van Horn & Barney 597, 134 Drawing instrument, G. Thomas 527,300 Drill. See Grain drill.	Sewing machine, J. B. Price	;
Drill. See Grain drill. 527,103 Drill bits, etc., tool for bandling, J. Barrett. 527,103 Drilling machine, R. D. Clapp. 527,237 Drilling pachine, R. M. Oownie. 527,237 Drilling percussion apparatus for, J. M. Ross. 527,088 Dumping apparatus, T. Long. 527,118 Dust collector, R. McWilliams 527,219 Electric battery, Smith & Geer. 527,288 Electric battery, Smith & Geer. 527,288 Electric heater, Jynamic, H. B. Collins 527,050 Electric machines in multiple, running compound wound dynamo, W. B. Potter. 527,075	Sheet methi, making expanded, J. F. Golding. 527,323 Show case and barrel cover, Daub & Rex. 527,323 Shutter bower, A. G. Christman. 527,047 Signal. See Electric signal. Track signal.	! !
Dumping apparatus T. Long 527,118, 527,119 Dust collector, R. McWilliams 527,341 Earring, J. Bonner 527,352	Signal recording device, W. H. Adkins. 527,258 Skate, roller, J. A. Segerberg. 527,164 Skate sharpening device, F. W. Taylor. 527,354	i '
Electric heater, J. R. Davis. 527,324 Electric heater, dynamic, H. B. Collins. 527,324 Electric machines in multiple, running compound	Slicer, potato, Struble & Turner 527, 253 Smelting, W. L. Austin 537, 321 Snap hook, Perkins & Scollay 527, 284	
Electrica switch, R. S. Kelsch. 527,177 Electrical converter, J. W. Packard 527,979 Electrical converter B. H. Witten	Sole for slippers or shoes, J. K. Griffith	
Electricity by solar heat, apparatus for generating, M. 1. Severy. 527,379 Elevator, See Hood elevator. Elevator, J. W. Seaver. 527,235 Elevator door opening or closin device, W. J. 527,236	Spicing machine, roll, J. Cain 327,117 Spicon, S. H. Kimball 527,115 Sprocket wheel, Murpby & Kolb 527,158	1
Elevator, J. W. Seaver. 527,295 Elevator door opening or closin device, W. J. Ferguson. 527,306 Floretor pletform, C. P. Warn. 527,306	Stalk cutter, H. W. Allén 527.232 Stalk cutter, W. H. Usry 57.322 Standp, self-inking hand, S. H. Leavenworth 527.326 Standp, feature, for woods on boxes F. 527.326	į
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Feiting machine, R. Heaton. 527,377 Fence making machine, P. J. Regan. 527,377 Fence, wire, G. Lehberger (r). 11,48 Wile, bill, W. O. Gottwals. 527,277, 527,277	Switch. See Electric switch. Railway switch. Switchboards, busy test for multiple, R. H. Polk. 527,383 Table. See Folding or extension table. Kitchen table.	1
Fire extinguisher C. R. Macomber 527 120	Thermopiles, apparatus for mounting and operating. M. L. Severy	: ' ,
Fishing tackle fastening, M. B. Allen. 57,255 Floor and ceiling, fireproof, Balph & Wright. 521,042 Flooring, hanger apparatus for use in laying fireproof, C. Carlson. 527,235 Flower holder. E. E. Bailey. 527,235	Thermopfles, apparatus for utilizing steam for heating, M. L. Severy	3
Flooring, hanger apparatus for use in laying fire- proof, C. Carlson	6 Thill support, D. A. Barrackman 527,101 1 Time recorder, employe's, Morse & Lovejoy 527,304 7 Time recorder, workman's, E. G. Watkins 527,304	1
Furniture leg attachment, E. Dempsey 527,14 Fuse box, electrical, J. W. Packard 527,17 Fuse capper, G. A. Teel 527,13	5 Tire, pneumatic, E. W. Young. 527,097 1 Tobacco or cigar moistener, J. A. Robinson 527,291 2 Tobacco pipe, W. E. Trott. 527,188	
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cited, B.G. Lamme 527,06 Glass with aluminum, decorating, C. Margot 527,216 Grand full, S. J. Conkwright 527,38 Grinding and polishing wheel, F. E. Cudell 527,19	Tran. See Animal trap. Fly trap. 1 Trolley wire support or banger, S. C. Woodbead. 527,353 1 Trunk, I. B. Kauffman. 527,333 1 Trunk, I. B. Kauffman. 527,333 1 Type dressing machine, G. Rehfuss et al. 527,373 1 Typewriting machine, J. P. Smith 527,037 2 Typewriting machine, J. P. Smith 527,037 2 Typewriting machine, J. P. Smith 637,038 1 Typewriting machine attachment for writing and 64 Typewriting machine attachment for writing and 657,133 1 Typewriting machine attachment for writing and 657,133	3
Gun, bolt, H. Leneweber	9 translating messages in cipher, R. Harte. 527,111 Valve, K. N. Harboe. 527,201 2 Valve, G. W. Van Tine. 527,321	2
chine, Norton & Richards. 527,34 Hame fastener, B. O. Smith 557,13 Handle. See Casket handle. Coffee or tea pot bandle. Harness, R. Ortega 527,34	valve, noat, J. J. Ravner 521,840	1 6
Dandie, Harness, R. Ortega	4 Valve for air brakes, automatic safety relief, J. 9 Coppersmith 527.14 2 Valve gear, G. Jalsoviczky 527.08 Vault cover, metallie burial, W. Eckels 527.23 4 Vehicle, L. W. Hampton 527.05 7 Ventilating cap, T. J. Ryan 527.31 7 Ventilator. See Car ventilator. 527.31 20 Voice rectifier, V. Carpi 527.22 20 Voice rectifier, V. Carpi 527.23	338
Hat sizing machines, water purifier for, W. J. Wiley	Ventilating cap, T. J. Ryan 527,18 Ventilating cap, T. J. Ryan 527,18 Ventilator See Carventilator 71 Vise, H. C. Rasner 527.21	5
Wiley 527.18		5 8
HOOK. See Snap hook. Hoop. See Mast hoop. Ice cream freezer and churn, combined L. T.	Washing machine, G. Brander 527,38 Washing machine, J. D. Cavanaugh 527,38 Water meter, automatic, G. Chaffey 527,04	4 0 6
Babbitt	Water meter, automatic, G. Chaffey 527, 14 Water sterilizing apparatus, A. V. M. Sprague 627, 66 Water tube besier, M. H. C. Shann 527, 67	اۋ

•		
1	Wax for dental or other purposes, metallic cov-	
1	ered, A. S. Rutherford	52 7,21 8
3	Wax product for dental or other purposes, A. S.	POR 010
	Rutherford	027,219
1	Sprocket wheel.	
ł	Windmill, F. A. & F. L. Franklin	527.276
П	Windmill, Righy & Reaves	527.157
١.	Window frame miller casing, J. H. Footo	527.111
3	Wire coiling machine, G. W. Crowder	527,144
Л	Wire stretcher, J. W. Austin	527,311
1	Wood bending machine, J. Dawson	507 107
	Wort cooler, H. E. Deckebach. Wrench, F. W. Nelson.	597 181
i	Wrench, W. E. Pugsley	527, 156
ĺ	Yoke attachment, neck, H. T. Richmond	527,372
,	Yoke center, neck, H. T. Richmond	527,373
)		

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527,108

527,237

527,238

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527,178

527,178

527,178

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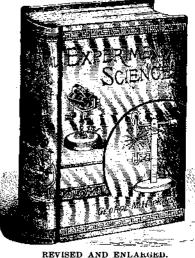
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