(12) C. B. S.—The paint peels off the smoke stack because it is too thick. Use plumbago, lampblack, and boiled linseed oil. Thin with turpentine. Scrape off the old paint. If the brass of the boiler head is always hot, you can clean it with washed emery moistened with kerosene oil.

(13) W. P. asks: What is the best wood to make a banjo with, and what kind of wood is used by the makers? A. We believe that the kind of wood used in a banjo has very little influence on its tone. Curled or pin maple is largely used. Any strong wood capable of being steamed and bent may be used for the hoop, and the kind of wood employed for the neck is merely a matter of taste.

(14) C. G. R.-We know of no reliable method of plating with nickel without a battery, or its equivalent in the shape of a dynamo. You can tin articles by cleaning them thoroughly, and dipping them in melted tin covered with wax or tallow.

(15) T. R. asks how to make a solder that will come off easily without being heated after being puton. A. We know of no solder that will auswer this purpose

(16) W. D.-We know of no solder that can be used on tin without resin, acid, or some other form of flux. Oil is sometimes used instead of resin

(17) G. B.-The lenses of a magic lantern will answer for a camera; it is not uncommon to use camera tubes for magic lanterns. Magic lantern tubes. as a general thing, are non-achromatic, and a tube of this class would make an inferior camera.

(18) H. C. B.-The phonograph cannot be applied in the manner suggested by you. It is necessary to speak very loudly in the mouth piece to produce any effect. The phonograph is the only instrument now known that will record articulate sounds.

(19) P. McC. says: I have a triangular box wood scale that is dull in appearance and loses distinctness by use. How can I varnish it so that it will remain bright and yet not soil my drawings? A. A thin coat of French spirit varnish would improve your scale.

(20) J. K. C. asks the focal distances of the different glasses in the eyepiece as shown in Fig. 10, SUPPLEMENT, No. 399. A. Beginning at the eye end, the focal lengths are respectively 1 inch, 2 inches, 1% inches and 11/4 inches.

(21) E. F. McR. asks the proper method to clean oily waste. A. Place the waste in a solution of water and sal soda, and then blow steam through the mixture.

(22) W. B.-"Boiling coal tar" thickens it and makes it set quicker by evaporating part of its volatile element.

(23) J. M. asks how long it takes a train to come to a standstill when the Westinghouse brakes are put on, and what causes them not to act sometimes? A. A train running forty miles an hour can be stopped inside of 500 feet on a level. The train will not stop so quickly if the brakes become locked on the wheels

(24) R. W. asks if the condensing of steam in an ordinary locomotive boiler, after the fire is put out at night, will cause a sufficient vacuum to draw water from a tank, the water in which is but little below the level of the water in the boiler, or will it cause a vacuum at all? A Yes; it will draw the boiler nearly full if the valve on the feed is not closed, provided that the safety valve, gauge cocks, etc., are tight, and also depending somewhat on the temperature of the atmosphere. More apt to do so in winter than in summer.

(25) L. J. S. writes: We have an artesian well about 1,100 feet deep and 6 inches bore, tubed down 380 feet with 3 inch pipe; the water does not come up any higher than 25 feet from the surface, and we are pumping it out. Now, about ten years ago this well was built, and was bored down 525 feet; it then flowed out of tubing at surface; one year after this it was drilled deeper, down to the present depth-1,100 feet -and the water stopped flowing and we had to pump ever since. Now I would like to fill this well up with some material or plug it so that it will only be 525 feet deep, as it originally was, and think it will then flow again. What is the best method to pursue? A. The drilled well for the distance between 525 feet and the bottom contains 112 cubic feet. As clean sharp sand nthe safest material to fill in with, we recommend it. Start by slowly filling in 25 cubic feet, and observe at the rate of 1.000 feet per second, and the ball is fired whether the water rises; if not, another 25 cubic feet, in the same direction with sufficient powder to give it so on until you have put in 112 cubic feet. Then sound also a velocity of 1.000 feet per second? A. Apart the well, and if the sand has not gone the same way from the additional friction by the train moving against that the lost water went, you should find bottom at about 525 feet, with a restoration of the old flow.

chlorate (NaClO₃) corresponding to the potassium chlorate (KClO₃)? A. There is. 2. Could it not be produced in the same way as the KClO₃? A. The simplest method of preparing sodium chlorate is by treating hydrofluosilicic acid with potassium chlorate, giving rise to free chloric acid, and then saturating the chloric acid thus formed with sodium carbonate. 3. In my Barker's Chemistry I find the formula for saltpeter to be KNO_3 . In the encyclopedia it is marked KO, NO_5 . Why 18 this difference in oxygen atoms? Which is correct? A. KNO3 is correct; KO,NO5 is the old nomenclature. 4. Could not a temperature sufficiently high be produced (and by what) to cause the combustion of nitrogen in oxygen or air? A. Nitrogen will burn in air or oxygen when an electric spark is passed through the mixture. 5. Ought unwashed nitroglycerine to explode under the hammer? A. If pure nitroglycerine is placed upon an anvil and struck with a hammer, only the particle receiving the blow explodes, scattering the remainder. 6. In attempting to make nitroglycerine I put the three ingredients together and agitated them, when a brownish-red gas came out and left a brown liquid. What were these, and why did I not ucceed in getting the nitroglycerine? A. The gas was the vapors of the decomposed nitric acid, and the coloration of the liquid was due to the same cause. See Manufacture of Nitroglycerine on page 3874 of Scien-TIFIC AMERICAN SUPPLEMENT, No. 243. Any large book dealer will have on hand or obtain for you a work of so standard a character as Watts' Dictionary of Chemistry

(29) W. M. G. asks the reason why salt adds to the freezing qualities of ice, and if there is anything known that will draw out as much coldness withmanufacturing. A. Salt has an affinity for water, and in exerting this characteristic feature causes the ice to melt, which then absorbs beat in the action of liquefying. In the SCIENTIFIC AMERICAN for June 21, 1884, we give, in answer to query 4, a number of freezing mixtures. By consulting this you will find several substances which act similar to salt in this respect. There are various machines for making ice, and they are described in different issues of the Scientific American Supple-MENT, such as Nos. 85, 32, 73, 171, etc.

(30) H. D. H. writes: 1. We are making a No. 133; would like to ask if there is any substance betterthan mica and ferrotype tin of which to make the diaphragm? A. No. 2. What improvements have been made on the phonograph since your SUPPLEMENT, No. 133, was published? A. No material improvements have been made on the phonograph since its invention. 3. Has any invention yet been made that will duplicate the vibrations on the tin foil, so that you could transfer a copy of the vibrations on to another piece of tin foil, and make it repeat what had been said on the first? A. We think not. Possibly they might be electrotyped.

(31) D. C. S.-Every chimney, gable, tower, and salient point of your building should be protected by a lightning rod. It is well to have a ground connection at each corner of the building, and all of the me-tallic parts of the roof and tower should be connected with the rods. The lower ends of the rods should extend to a sufficient depth in the earth to reach a stratum that is constantly wet. It should be laid in a trench extending away from the house from ten to fifteen feet, and should be surrounded with metal scraps, or better with coarsely granulated coke. Rods may be of copper five-sixteenths of an inch in diameter, or of iron double this diameter. All the joints should be soldered as well as screwed together. Insulators are worse than useless. For information on finding a latitude consult SUPPLE MENT, No. 316.

(32) E. F. S. asks: 1. What telephone has the most extensive use? A. The Bell telephone is used almost exclusively. 2. What telephone would be most suitable for use in a village? A. Any of the electric telephones will answer your purpose. 3. Is a non-electric telephone good for distances of a mile or two? A. Acoustic telephones will work well for a distance of a mile in a still day. 4. Can the telephone be made to pay in a village of 2,500 or 3,000 inhabitants, and what is the usual plan of charging or receiving payment for its use? A. It would probably pay. For full information on the management of central offices, you should write to some of the telephone companies.

(33) J. P. C. asks: What speed will a capaon hall have if when fired the cannon is on a train moving the air at a speed of 1,000 feet per second, which would somewhat retard the velocity of the ball, the ball

would have a velocity due to its discharge from the

(28) R. S. N. asks: (1) Is there any sodium Discharge for 1/2 inch nozzle. 3/2 gallons per minute; do. for ¾ nozzle, nearly 2 gallons per minute; do. for ¾ nozzle, 7% of a gallon per minute. 2. Will the water meters in use reduce the pressure on the stream passed through? If so, how much? A. If the water meter is of sufficient size to pass the above quantity per minute, it will not lessen the pressure.

> (36) A. J. D. asks: What is the dark bluish crocus used by burnishers for polishing? A. It is rouge. 2. What is the best record for a 100 mile go as you please? A. The best time for 100 miles is 18 hours 8 minutes and 15 seconds, in London. The best time in United States is,150 miles 850 yards in 24 hours. Hazael made 600 miles 220 yards in 6 days.

> (37) W. R. H. writes: 1. I wish to run a sewing machine by power; would you advise weight or water power? A. We advise water power, if it is available; but if you are obliged to pump up the water to secure the power, it would be better for you to procure some form of small motor. 2. Could you give me directions for making a very small turbine wheel, say 1 inch or so, which would run my machine 2 hours with a hogshead of water at a height of about 20 feet? A. You can secure small turbine wheels from any of the makers who advertise in our columns. 3. Is the Backus oring gold the Etruscan color. A. Etruscan is made by eating the alloy from the surface of the gold by a chemical or electrical process.

(38) E. C. B. asks the number of cubic feet of water and the number of pounds of coal engines of 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 horse power would need to run at 60 pounds pressure. A. Engines and boilers, in their out melting the ice. Also the ingredients used in icc modern variety of kind and economy, present so many and variable features of construction that no special data can be given that will apply to any two varieties; generally about 9,000 feet. A depth of about five miles ¹/₃ to 1 cubic foot of water per horse power per hour are about the extremes, using about 3 to 6 pounds coal per hour per horse power.

(39) T. H. B. writes: Suppose the cylinder of an ordinary steam engine to be lengthened out to twice its present length, no matter what that may be, and reduced to a corresponding extent in diameter, so that the cubic space in the cylinder will remain as large as before and hold the same amount of steam; will the phonograph according to instructions in SUPPLEMENT, lifting power on the end of the piston rod be the same as in the shorter and wider cylinder? A. No; the lifting power, or force upon the piston rod, is proportioned to the area of the piston. The larger diameter exerts the greater force. The length of the stroke is the measure of work done under that force.

> (40) A. E. M. asks: 1. What could I use in bookcases, closets, and wardrobes to get rid of wood lice, book worms, and small spiders, etc., which keep getting in continually? A. Use camphor gum in small boxes set upon the shelves or among the books of your case, for insects. 2. Could sulphuric acid, carbonate of potash, or some other absorbent of moisture be used safely in bookcases to prevent mildew? A. Carbonate of potash or quick lime in open glass vessels will absorb moisture. Use no acid. 3. There is an idea prevalent among the country people here that trees should be felled for timber when the moon is waning, as the sap has then descended. I, myself, am inclined to rank this among the many superstitions concerning the moon, and should like to get your opinion on the subject. A. The moon has no influence upon the time thick at bottom and 21/2 feet thick at top, front side perof cutting timber. Always cut at the wane of the sap or fall of the leaf. I wish to carry a lightning rod into a well close to the walls of the house; but I have a pump set over it which works in all kinds of weather, and I fear it would be dangerous to handle it during a storm. Do you think there would be any risk to the attendant? A. Carry the lightning rod several feet as will make solid filling between the large stone. 4. underground to the well, and then down to the bottom without touching any part of the pump. It will be safe to keep away from the pump during a violent thunder storm, and still safer to make a water connection at a distance of 2 or 3 rods from house and well. We do not know who makes the wagons you ask about.

> (41) C. M. asks: 1. Would a bullet or other missile thrown perpendicularly into the air, fall to the tection. Make an ample sluice way of plank or with point of starting with the same velocity and force as it two walls and a covering of large stone for the stream received upon starting? A. Theoretically yes; practi- while building the dam. Make the top perfectly level cally only if in a vacuum. 2. Can electricity be used for and as long as possible, for the possibilities of a flood, the purpose of heating and warming houses, and for and protect the ends thoroughly against leakage ty has not yet been practically realized, though it is a dam of this kind will be stronger if slightly arched certainly possible. 3. Would a steamboat made upon the up stream, say 4 or 5 feet in a 50 foot dam. catamaran, or double hull, plan require a greater or less force to propel it at a given velocity through the water, carrying a given load, than would be required steamer of equal displacement with the first, if both pulverized and sprinkled around the infested places. A

length. Your mirror may be much smaller than the projected image, but to get the best results you should have a condenser in the form of a double or plano-convex lens to concentrate the light on the picture. 3. Could I also copy pictures with the "blue process of copying tracings" in the camera obscura, that is, could I copy pictures by putting the sensitive paper in the box and reflecting the image on it? A. The blue process of copying cannot be utilized in this way.

(44) W. S F. asks how the water proof blacking, or more properly speaking "liquid gloss," for ladies' and children's shoes is made. Kindly give composition and quantity of each. A. A fine liquid blacking consists of ivory black and molasses, of each one pound. sweet oil and sulphuric acid, of each four ounces. Rub together the first three until the oil is perfectly killed, then gradually add the sulphuric acid, diluted with three times its weight of water. Mix well and let it stand for three hours, when it may be reduced to a proper consistency with water or sour beer. A number of recent shoe polishes and varnishes are described on page 150 of Scientific American, for March 10, 1883, to which we refer you.

(45) R. P. Y. asks: Does the telegraph cable sink the full depth of the ocean, which I believe water motor a plain breast flutter wheel? A. It is a is five miles, and if so, what sort of grappling maplain fan wheel. 4. Please give me directions for col- chinery is it that will work at that depth? A. There may be narrow chasms in the ocean bottom over which the cable is suspended, but generally the cable rests on the ocean bottom. We have in the back numbers of our paper described several forms of grappling apparatus for raising ocean cables. The depth of the Atlantic reported by the cable soundings between England and France and Newfoundland, was nowhere over 15,000 feet, the bed consisting of two valleys separated by a broad ridge running from the Azores to Iceland, and the depth on this ridge being has been reported south of the Grand Bank of Newfoundland, but all the cables run on the higher plateau to the north of this.

> (46) A. C. C. asks: How many cells would it take of a Grenet fluid battery, zince 5 x 216 x 16 inch thick, carbons same dimensions, to heat to incandescence 21/2 inches or 3 inches No. 38 platinum wire, and how long will each zinc last, if used 5 hours every evening? A. Six cells would probably do it. If the zincs are kept well amalgamated, they might last for two months.

> (47) T. W. H. writes: The reservoir of our water works consists of a stand pipe 6 feet in diameter and 160 feet in height. In the winter we are bothered more or less with ice forming around inside of the pipe. We have a large cylinder stove at the base; don't you think if we would run about a four inch gas pipe up through the water on the inside, then keep a good fire at the base and let all of the heat go up through. that it would keep the pipe free from ice? A. Better run a second inlet from the pump to near the top upon the inside, and pump the water to the top during very cold weather. This will keep up a circulation, and tend to prevent freezing.

(48) G. C. P. asks: 1. Can 1 build a dam of cement and sand by making a box to hold the mortar until it hardens? A. Yes. 2. Can I use small stones to help fill up and save cement, stones to be from 3 inches to 18 inches diameter, dam to be 7 feet high, 7 feet pendicular and pond side slanting? A. Use as much large stone as possible. Make the filling with coarse sharp sand and Portland cement. 3. What proportion of small stone can I use and have it strong? The dam is to be built on ledge the whole leugth, and is on a small stream and is 50 feet long. A. Use as much small stone Which will be the best stones to use round cobble stones or ledge stone got by blasting? A. Fragments are better than couble stones, and will resist water and ice cut. The top of the dam should be capped with a layer of the largest stone that you can get, laid inclined a little toward the pond, so that ice will not push them off. Back the dam by a filling of sand and stone for several feet level with the top for flood proother domestic purposes? A. Heating rooms by electrici- through the soil if the banks are not rocky. Lastly,

(49) J. S. asks for a receipt for removing water bugs or red roaches. A. Borax is considered one to propel a single hull steamer with the same load on a of the very best roach exterminators. It should be boats are made of the best shape of their kind? A. solution of 1 oz. poke root boiled in 1 pint of water The steam catamaran has not thus far been shown equal until the strength is exhausted, and then mixed with es and spread on plates and placed in localities infested with these pests, is "sure death." Paris green is likewise used, but undesirable, as it is poisoning machines claim they get rid of side draught by ous. A paste made of 1 part powdered chloride of lime and 1/2 part of some fatty matter is said to be ef-· fectual in driving cockroaches away.

(26) N. W. asks: 1. What saving in fricrefer to rollers whose surfaces touch the axle and its | air. box, not to rollers which turn on axles of their own. The saving of the latter is easily calculated, but the former seem difficult because they grind against each other. A. Friction rollers should not grind against each other, but should have end bearing running in a ring, which keeps each roller in its proper place. This form has the least friction. We have not the data for the amount. 2. Haswell's work on Engineering, page 354, states that the moving friction of a locomotive is 15 pounds per ton and that of trains only 6 pounds per ence of friction in locomotives and cars arises from the different weight upon journals.

determining the lifting power of a magnet? A. You do not say whether you mean electro or permanent magnets. As the power of a magnet depends on so many circumstances, it would be difficult to provide a formula for determining this accurately. 2. What sized wire should be used for the primary coils of a Hughes inber 24 wire answers very well for both coils.

gun added to the speed of the train, or 2,600 feet per tion is effected by anti-friction rollers, say 1 inch second, and in one second would be 1,000 feet ahead of diameter, surrounding an axle of 2 inch diameter? I the train, less what would be due to the friction of the

(34) W. W. H. asks: What is the best process for ebonizing wood. A. SCIENTIFIC AMERICAN SUPPLEMENT, No. 207, gives several methods for dyeing wood black. A recent process consists in pouring 4 quarts of boiling water over 1 ounce of powdered extract of logwood, and when the solution is effected add 1 drachm of potassium chromate and stir the whole well. Continue the application until the wood is dark enough. When the work has become ton. Is this true, and if so, why so? A. The differ- dry, sandpaper down the grain toget a smooth face; and as the work to be ebonized must be quite free from holes, oil and fill in any of them with powdered drop

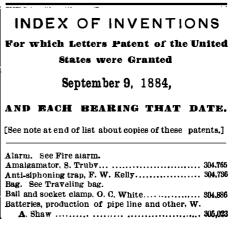
black mixed in a filler. Then give it a coat of quick (27) J. C. asks: 1. Is there any formula for drying varnish, and rub down with finely pulverized pumice stone and linseed oil until a good surface is acquired. A good wholesome varnish for ebonized work is obtained by dissolving black wax in spirits of wine.

duction balance? What for the secondary? A. Num- of 14. %, and 1/2 inch diameter, under a pressure of 60 have it smaller? A. If your tube is large enough, it will Batteries, production of pipe line and other, W. ; pounds to the square inch, pressurefully sustained? A. answer as well as if the box were extended to that

to single hulled boats in the utilization of power.

(42) B. W. S. says: Many makers of mowmeans of a rod running from shoe to the whiffletree connection on pole. Will you inform me if this is good reasoning, or possible? A. If by the arrangement designated the power is applied at the center of resistance, side draught will of course be obviated.

(43) J. K. says: I have a lens 5 inches in diameter, 24 inches focus, for the camera obscura to enlarge photographs, but cannot reflect it on paper as given in one of your SUPPLEMENTS. I put the lens in a tin tube, one sliding within the other, so as to give it the right focus; my box is 12x12 inches and my mirror is 12x14 inches. Please let me know where the defect is. Is it on account of my tube being too bright? A. Your tube should be blackened inside. See direction in recent number of SCIENTIFIC AMERICAN for blackening tubes. 2. Does it make any difference if I put the 24 inches in the tin tube or in the box? Does my mirror want to be of the same size as the lens magnifies (35) R M. C asks: How many gallons of or can I have it smaller, that is, if my lens magnifies up water per minute will be discharged through a nozzle to 14 inches, must my mirror also be 14 inches, or can I



Battery. See Electric battery. Voltaic battery.		Ge
Beam or girder, metal, E. M. Butz, 304,794, 304,795, 304,797,	904 798	Gla Gl
Beams. girders, etc., structural shape for. E. M.		Gr
Butz	304.717	Gr Gr
Beer preserving apparatus, J. F. Kausier Belt holder, machine, H. Ogborn		Gr
Bicycle saddle, W. S. Kelley Boats, construction of. T. H. Morgan	304,827	Gr Gr
Boller. See Steam boiler.		Ha
Book cover. copy, J. H. Moss Boot jack. J. Reining		Ha Ha
Boot or shoe heel stiffeners, machine for cutting G. F. Moore.	,	Ha Ha
Boots, shoes, etc., machine for forming felt, Haw-	•	Ha
ley & Messer Bottle stoppers, manufacture of, J. M. Lewin		Ha
Box. See Work box. Bridgegate, T. H. Barnaıd	304,690	Ha
Brush and toile t case, combined hair, M. Hell-	•	
wig Brushes and brooms, apparatus for preparing	·	Ha H≀
fiber for the manufacture of, F. Kunz Buckle, D. Freer		Ha Ha
Buckle, W. E. Smith	304,870	Ha Ha
Buildings. construction of metal, E. M. Butz	304,793	Ha
Bung extractor, C. O. CookBurglar alarm circuit closer, A. Iske		Ha Ha
Cables, guide and tension device for traction, W. B. Ross		' He ' H€
Cane mill, J. Fehrenbatch	304,813	He
Car coupling, D. Carlough Car coupling, L. N. Fowler	004 7 0	. T T 2
Car couping. G. E. Nichols Car dumping apparatus, railway, P. Leavitt	304,847 304.831	Hi Ho
Car heater, J. Q. C. Searle	304,867	Ho
Car, railway, H. Root Car replacer, T. W. Reed	304,856	Ho
Car spring, E. Cliff Car ventilator, railway, Outten & Jones		
Card, playing, W. Ramsay Carpet sweeper, W. H. Castle	305,018	Ho
Carrier. See Cash and parcel carrier.		Ho
Cart, fertilizing and seeding machine, combined, L. M. Milbank		'Hu lc€
Cartridge, W. Gardner		[n] lns
Cask rolling machine, L. A. Mueller	305,014	Ins
Casting mould, R. W. Traylor Centrifugal machine, G. E. Stillman	305,026	Ins Iro
Cerealine, making a product from Indian corn known as, J. F. Gent		Ja
Chair and bed, child's suspended adjustable. W. H. Howell		Ju
Chandelier, extension, L. T. Lawton	305,010	Кп
Churn, J. 11. Edens Churn. Hayworth & Davis	304,727	La
Cigar slitter, J. Pusey Clamp. See Ball and socket clamp.	305,017	 La
Clip. See Newspaper clip. Clothes line, J. Paul	204.052	La
Collar attachment, sweat horse, E. E. Withey	304,032	La
Collar, horse, J. Straus Column, girder, or pilaster, metal, E. M. Butz	304,969 304,786	Le Lif
Column, pilaster, or girder, metal, E. M. Butz, 304,787 to	304.792	Lif Lir
Columns, pilasters, etc., structural shape for, E.		Lo
Cooler. See Milk cooler.		Lo Lo
Corns, etc composition for removing, A. Hentz Cotton press, R. Voigt		Lo LO
Cuffs, clasp for holding, M. M. Hitt Cultivator, M. M. Estee	305.001	Lu Lu
Cultivator, J. Jones	304,783	Lu
Cultivator, spring, J. M. Elder Cultivator, sulky, W. H. Roberts	304,861	Ma Me
Cultivator, thill. J. M. Ripson Cutting apparatus, H. R. Allen		Me Me
Deck plate, H. Adams	304,684	
Dental chair, Wallace & Snyder Dental plate mould, L. Vanderpant	\$04,766	Mi
Derrick forks, apparatus for working, C. Stone Diamond cutting machine, H. C. Reichardt		Mo Mo
Dish, covered, Elson & Smith Door and gate spring. J. Broughton	304,997	Mo Mu
Door signal, A. L. Dorn	304.803	
Door, storm and screen, H. G. Wolfram Dralning machine, centrifugal, H. W. Lafferty		Na Ne
Dress shield, S. Rauh Drill. See Grain drill. Rock drill.		Ne No
Dril) swivel, H. C. Reichardt		Nu
Electric battery, self-sustaining, W. A. Shaw Electric cable, non-inductive, M. E. Shaffer	304,759	Nu Nu
Electric lighting system, E. Weston		0ff
Electrical meter, E. Weston	304,881	Oi Pa
elevator. Hand elevator.		Pa
Elevator, M. N. Hutchinson Elevator cars, stopping mechanism for, Adams &		Pa Pai
Vaughan Elevator gearing, C. Esplin	304,771 304.810	Paj Paj
Elevator guard, automatic, F. P. Hinds	305,000	Per
Elevators, electric indicating device for, C. L. Clarke	304.908	Pia
Elliptic spring, E. Cliff End gate, wagon, C. Hotz	304,991 304,933	Pi⊧ Piŗ
Engine. See Steam engine. Expanding wrench and mandrel. A. E. Lytle		Pla

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Battery. See Electric battery. Voltaic battery. Beam or girder, metal, E. M. Butz,	Gears or pulleys, balancing, C. Esplin	Refrigerating and ice machines, water cooler for, G. W. Stockman
304,794, 304,795, 304,797, 304,798	Glass melting furnace, R. Potter	
Beams. girders, etc., structural shape for. E. M.	Grain and flour elevator, R. H. Everett	
Butz	Grain drill, S. H. Koble	man
Beer preserving apparatus, J. F. Kauster 304,735	Wiesebrock	Reinholder, C. A. Dougherty 304,804
Belt holder, machine, H. Ogborn	Grain meter, automatic, J. C. King	Rein holder, C. Pentz
Bicycle saddle, W. S. Kelley	Grindstones, device for truing, M. A. Barber 304,774 Guard. See Elevator guard.	Rein hook, check. S. H. Stewart
Boller. See Steam boiler.	Hame fastener, C. A. Denison	Removable handle. Shepard & Adams, Jr 304,963
Book cover. copy, J. H. Moss 304,845		Revolver, A. F. Hood
Boot jack. J. Reining	Hand wheat rake, D. Bigelow	Rivet, slotted, H. Rogers
G. F. Moore	Handle, G. A. Washburn 304.879	Roller coupling device, P. Eckel
Boots, shoes, etc., machine for forming felt, Haw-	Handles for pitchers and household articles, J.	Roof, balanced stack, F. W. King 304,828
ley & Messer	C. Milligan	Roofing material, H. M. Miner
Bottle stoppers, manufacture of, J. M. Lewin 304,740 Box. See Work box.	Knapp	used as a substitute for hard India, Barbler &
Bridge gate, T. H. Barnaid	Hundles to vessels, attachment of, Miligan &	Coiffier 304,775
Brush and toile t case, combined hair, M. Hell- wig 304,728	Chaumont	Sash holder, W. S. Young
Brushes and brooms, apparatus for preparing	Harness pad. Nave & Bauer	Saw, J. E. Emerson
fiber for the manufacture of, F. Kunz 305,009	Harness strap attachment. T. S. Very 304,979	Saws, motor for driving, D. E. Dutrow 304.996
Buckle, D. Freer	Harness trace supporter, M. E. Lasher 304,943	Scoop, measuring. E. Kohler
Buckle, W. E. Smith	Harrow, revolving, J. C. Robinson	Scow, dumping, G. Clark
Buildings. construction of metal, E. M. Butz 304,793		etc., from walls, reversible, J. E. W. Coleman. 304,909
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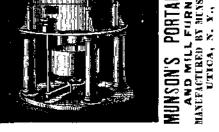
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