Lay the filling on with a brush, rub it in well, let it set that it will not work in very cold water. It may re-20 minutes, then rub off clean. Let it harden some time, rub smooth, and if required repeat the process. When the filling is all right, finish with linseed oil, applying with a brush, wipe off, and rub to a polish with fine cotton, and finish with any fine fabric. 3. Also a process for giving wood rollers a high polish, quickly, while in the lathe. A. Dissolve sandarac 1 ounce in spirit of wine ½ pint; next shave beeswax 1 ounce and dissolve it in sufficient quantity of spirits of turpentine to make it into a paste; add the former mixture by degrees to it, then with a woolen cloth apply it to the work while it is in motion in the lathe, and with a soft linen rag polish it. It will appear as if highly var-

- (11) J. C. R. writes: 1. I am building a steam launch 40 feet long by 12 feet beam; what description of boiler for strength, durability, and ecouomy, and would take up the least room, is the most advisable for me to put into her, and what may it cost? A. quickly? A. The vaporizing process consists in treat-A borizontal cylindrical boiler with cylindrical furnace, ing the alcohol with a standard liquor and allowing it two return tubes above and alongside of the furnace, to flow over shavings, while the air coming in contact 2. What is the best description of engine and propeller with the vinegar hastens the operation. 4. What is (say two or four blades) to give her say a speed of 12 water lac? A. We presume reference is made to the knots per hour, and correspond with the boiler in all particulars, as well as taking up the least room, also pale shellac, borax 1 ounce, water 1 pint. Digest at its cost? A. The ordinary vertical inverted engine, non-nearly the boiling point until dissolved, then strain. 5. condensing, if economy of fuel is not much object; Is there any method of taking a positive picture which if it is, then use a surfacecondensing engine, either sim- is entirely complete directly in the photo camera either ple or compound. A twin screw, three blades, will be on paper, glass, or other surface? If not, what is the model to get 12 knots per hour. Price of engine and appurtenances, about \$850. Of engine and boiler, pro-purtenances, about \$850. Of engine and boiler, pro-entific American Supplement, No. 293. peller and shaft, with all appurtenances and connections, about \$1,800.
- (12) O. H. McK. asks: 1. How can I polish small Norway iron hooks about 1 inch in length? A. You can polish small hooks by tumbling in a keg r thousand very soft cast iron tubes about 8 inches in length, 34 inch hole, and closed at one end; they have grease in them, and I want to know how to get them perfectly clean. Can you tell me of some wash or other means to clean them without rusting them? Would a wash of sal soda and water rust them? A. Boil the pieces in water with a little soda and lime, say; one ounce of each to a pail of water. Take the work from the water boiling hot, and dry immediately by placing npon a hot plate or in a warm place. 3. How can I casebarden small Norway iron rivets about % inch long and 1/2 inch diameter? A. Caseharden the rivets by packing in an iron box (sheet iron will do) with charcoal and powdered prussiate of potash, or bone charcoal or scraps of leather cut fine. Heat for an hour at a full red, and pour out rivets and dust into a tub of water. You cannot wait to separate the rivets from the packing. They will cool too fast, and interfere with the hardening.
- (13) S. J. W. writes: I see by your issue of March 21, my question (51) was not satisfactory in regard to power of screw. The lever will be 12 inches; power applied at end of lever, 75 pounds; screw oneeighth pitch, point tapered to angle of 30 degrees working between two pins to suit angle of screw point. What pressure would they exert in separating any amount of weight, in other words, what weight will they lift? I think the power is equivalent to a screw 32 to the inch in the way it is applied, if the rule holds good in all cases. Am I right? With a traveler of 75 inches for lever, the pins only move one thirty-second. The rule I used. believe is, as pitch of screw to circumference, so is lever, and divide by the pitch of the screw, distances
- (14) E. S. B. asks: If by electrical action I deposit all the lead from a solution of the plumbate of potash, will the remaining potash solution still retain the power of disintegrating, and through use of a gathered in other places. continued current of electricity again deposit the new lead ingredient added to constitute the plumbate of potash? A. 'The potash is not affected under the circumstances; potassium hydroxide is formed,
- (15) J. W. P. asks the formula usually used in America for calculating the power of stationary and marine boilers, and also the safe working pressure of the same, for iron and steel plates. A. There is no generally received rule. From 12 to 16 feet of heating surface is usually allowed per horse power. The smaller surface to the plainest, simplest, and well proportioned boiler. The only accepted standard is 30 pounds of water evaporated per horse power per hour.
- (16) P. F. Manufacturing Co. asks the best process to japan wire. A. Japan wire by drawing it through the varnish, holding it in the varnish by passing the wire through a hole or slot in a piece of iron or brush to draw off excess of varnish or make the varnish thin enough to just cover the wire in quantity. for friction and power consumed in running the wind-Hang the wire in an oven heated to 250°, supposing the ing gear? A. An actual 4 horse power engine should parts by measure, alcohol 1 part. Mix, and add 1 part wire may be 1 foot or 10 feet long, as you give no detail of what you wish to do, or as to what is the shape of the wire.
- (17) F. A. L. asks how he should construct a rain water cistern in gravelly soil. A. Build the cistern with hard burned bricks and Portland cement, backed with a grout of Portland cement and clean sand. Plaster the inside with a thin coat of clear Portland
- (18) C. K. asks the theory of the working very cold water; and have you a receipt for marking bags and bales? A. Inspirators work by the transfer weight in water by its instantaneous condensation in contact with water. The water inducing the condensation partaking of the velocity of the steam re-enters the boiler not only against its own pressure, but will feed me how to make a strong, quick drying glue size? A. a boiler of much higher pressure. We do not know For a quick drying size, we would recommend you to its use a surplus of mercury is always provided for. 2. S. Parker.

quire a different adjustment for extremes of temperature in the feed water. Lampblack and turpentine is generally used for marking bales and boxes

- (19) J. McF. writes: 1. In Supplement, No. 247, you give bacteria process of vinegar making; I want to know how many and what size of air holes the purpose of promoting the acetification, which is the oxidation of the vinegar, and therefore we would recommend you to use quite a number, and preferably a large number of small ones, rather than fewer larger ones. 2. Will the mixture of alcohol, water, etc., acetify  $without {\tt mycodermacetifirst} being sown on the surface?$ If not, how or where can this be obtained for the first mixture? A. No. The mycoderma are obtained from fermented vinegar. 3. What is the vaporizing process of vinegar making, in which alcohol is vaporized in such a way as to produce a superior article of vinegar water lac varnish, which is a mixture of 5 ounces of best. You must have ample power and a good, easy quickest method of securing positive pictures? A. See
- (20) S. R. C. asks what he can use to clean wood type, where the black and colored inks have become hard and dry on the sides and face of the type Benzine or turpentine has no effect on the hard dry ink. A. Wood type should be cleaned as soon as the volving upon a shaft. Use sharp sand mixed with the forms come from the press. When the forms are hooks, and finish with saw dust. 2. I have several allowed to stand a few days, it is very difficult to remove the ink. We sometimes use oil to soften the ink, and then remove it with benzine or turpentine.
  - order to produce a brilliant surface would be to tin the precipitate separates, it is to be redissolved by adding spoons. This is accomplished by dipping, and the process is fully described under the head of Electro Metallurgy, in Scientific American Supplement, No. 310. We think that you can silver the articles by mixing one part silver chloride with 3 parts pearl ash, 11/2 parts common salt, and 1 part whiting. Rub this mixture on tinctly green; and the articles to be plated, previous the surface of the metal by means of a piece of soft leather or cork, moistened with water and dipped into zinc fragments. The boiling is continued for fiftee the powder. It is likewise possible to coat certain minutes, when the coating of nickel is completed, an metals with nickel by first boiling the article in a solution of zinc chloride containing metallic zinc, and then adding a soluble nickel salt.
  - wire used in a cable, having for data the number of means of your valuable paper, if an engine with tw the wire, the number of strands, and the number of cylinders, 1 inch bore and 2 inches stroke, with from twists per unit of measure of each, be obtained? A. 80 to 100 pounds of steam and making 700 revolutions For the length of a wire in a strand, add to a given length as many times the circumference of the strand as there are twists in the given length, for the outside wires; and proportionately for the inner row. The center wire is supposed to be straight. Proceed in the same way for the strands. The excess of ware in each strand added to the excess of the strands over the length of the cable will give the whole length of wire
- (23) J. W. C.—The aurora has been made power applied to weight raised. A. Your rule is right. a special study by physicists and spectroscopists for Multiply weight or pressure applied to the end of the several years. Its true solution has not yet been levers by the distance traveled in one revolution of the reached, owing to the variable and complex spectra caused by the interference of the atmosphere and its and pitch of screw to be in inches or fraction of an inch; moisture. Its primary element, however, is supposed but this will give the theoretical result. A very large detuction must be made for friction, say 35 to 40 per supposed to be an overproduct of the spinnerets of screw 1 foot long? A. Yes. spiders, although there is room for observation as to their fungoid origin. The fine ashy dust may have a volcanic origin, and be connected with the phenomena of the red sunsets during the past season. It has been
- gine should it require to raise one ton 40 feet highlin and if I put in a dozen jets, economy will not be at one minute on ordinary platform elevator, making rea- tained. A. We fear the jet could not be safely applied sonable allowance for friction and power consumed in in your case. To get the benefit of the gas jet, th running winding machine? Weight of elevator plat- should be entirely free of ashes and clinkers, which is form is balanced by counter weight, all but about two not the case with heating boilers, as they are generally hundred pounds. Winder is of the common worm gear run for many hours without clearing out ashes. 2 type, run by belt from counter shaft, with 32 inch winding drum. A short counter shaft with two pulleys on it, one to receive belt direct from engine, the other to without any special provision. 3. If I should match winder pulleys, is all the gearing there is between gas into the ash pit, about 6 inches below the grate, in engine and winder. A. For unbalanced weight of 2,440 pounds, 40 feet per minute, 3 horse power, mak- plosion be the result? A. Any experiment should be ing allowance for friction, etc., of the arrangement you describe; we advise to double this power, or say 6 pit, occasioned by a "clogged" grate or insufficient horse power. 2. With the above rig, what weight draught, would be likely to lead to an explosion. should a four horse power engine be expected to hoist 40 feet high in a minute and a quarter, what weight the acid used to each on steel plates for printing. Also pushed nnder the surface of the varnish, also a scraper same height in a minute and three-quarters, what weight what is meant by nitric acid 15° B.? A. Iodine 1 in two minutes, making reasonable allowance as before ounce, iron filings // drachm, water 4 ounces. Digest raise, allowing as before one-half for friction, etc., 40 double nitric acid (sp. grav. 1.28). Apply it from 11/2 feet in 11/4 min. = 32 feet per minute, 2,091 pounds. For to 15 minutes. Dilute nitric acid is frequently all that any other velocity the weight will be decreased as speed is used; 15° B. means 15° on the Baume scale of hyis increased; say 64 feet 'per minute (double velocity), the weight will be one-half=1,046 pounds.
- (25) F. J. F. writes: 1. In answering a correspondent a few weeks since, how to remove impurities from lead, you mention substances rich in oxygen. Now, in my business I use anyalloy-stereotyper's metal-but it is too granular, too hard. Now, will the of an inspirator, and why does it refuse to work in antimony, etc., liberated by the nitrates, etc., be in a condition to be recovered, so as to use again, should my metal get too soft? In what quantity must the of the high velocity of the steam to its equivalent nitrates, etc., be added? A. The process referred to is not suitable for alloys. The stereotype metal having the composition of tin 1 part, antimony 1 part, lead 4

use a good glue and add alcohol to the preparation re- What is the best alloy to cast small figures, sulting from having dissolved small pieces of glue in when completely in solution it will be found a most excellent article.

- (26) F. A. L. asks for a work published on the manufacture of perfumes. A. A Comprehensive are sufficient for 200 liter vat. A. The air holes are for Treatise on Perfumery, with Thorough Practical Instructions, and Careful Formula, by R. S. Christiani. 8vo, 1878, price \$5.00. Art of Perfumery and the Method of Obtaining the Odors of Plants; the Growth, and General Flower Farm System of Raising Fragrant Herbs, with Instructions for the Manufacture of Perfumes, Scented Powders, etc., 4th London edition, 8vo, 1875, cost \$5.50. The above are the two most important publications on the subject.
  - (27) M. McL asks how patent leather can be prevented from cracking, especially patent leather boots. A. To prevent patent leather from cracking, always heat the leather over the fiame of a candle before inserting the foot in the shoe. Heat renders patent leather soft and pliable, so it is advisable to strain, and the cochineal, boil gently for half an hour, wear overshoes over patent leathers in very cold weather. There is also an excellent cream paste sold then the varnish, consisting of rectified spirits of wine, in London, and called Metropolitan varnish, which keeps patent leather in excellent condition. We believe it cannot be bought in this market, however,
- (28) D. S. F. writes: There is a traveling man here purporting to nickel plate spoons, knives, forks, etc. He has a gasoline lamp, and above the lamp he has a cylindrical tube about 21/2 inches diameter and about 10 inches deep; in this tube he has his dipping metal, which is kept fused by the heat of the gasoline lamp. He dips his article to be coated first in muriate of zinc, then in oil, and also in water. Will you tell me the metal or metals he uses in his tube, or what kind of metal or amalgams will answer in this way for coating the spoons, etc., or any other simple process without the use of a battery? A. We presume you refer to Stolba's process, which is as follows: Into the plating vessel-which may be of porcelain, but preferably of copper-is placed a concentrated solution of (21) J. R. S. asks how to make pewter zinc chloride, which is then diluted with from one to looklike silver by a wash. A. The best thing to do in two volumes of water, and heated to boiling. If any a few drops of hydrochloric acid. As much powdered zinc as can be taken on the point of a knife is thrown in, by which the vessel becomes covered internally with a coating of zinc. The nickel salt, either the chloride or the sulphate, is then added until the liquid is disthoroughly cleaned, are introduced, together with som the process is finished. The articles are well washe with water and cleaned with chalk.
  - (29) N. F. W. writes: I am going to make (22) J. D. asks: How can the length of a steam tricycle, and would like to ask, through th minute, be sufficient to obtain a speed of from six to eight miles? A. Engine 1½ inches by 3 inches preferred It has the most power, and will have less weight in pro portion to power. 2. Would one cylinder 11/2 inche bore and 3 inches stroke be better? A. On smooth leve roads should make eight miles per hour, if the power properly applied. 3. What size boiler would I need and how large the wheels? A. Boiler should have 30 to 35 feet heating surface.
    - (30) C. G. L. asks: 1. In the Scientific AMERICAN of December 9, 1882, you gave a cut of propeller boat. 1. Can such a boat be made to run ter miles an hour? A. Not by the power of one man. 2 Is it any harder work to run one than to row? A. Yes 3. Can greater speed be obtained with a screw than
- (31) C. H. L. writes: 1. I have a self-feed ing (of coal) steam boiler for heating, with a 30 inch cir cular grate. To obtain the benefit of the addition of small supply of gas to the fuel, how shall I proceed?  $\, {f I} \,$ I put a single jet close under the grate in the center (24) W. G. B. asks: (1). What power en- I fear only a small portion of coal will be benefited Should not the gas be mixed with air before it escapes from the burner? A. The jet will get its supply of air a 30 inch ring, pierced with 4 holes, would not an ex-
  - (32) J. M. M. asks how to make or mix the
  - (33) B. T. S. asks: What is "flexible sandstone"? Too bard to cut with a knife, yet pliable between finger and thumb, same as piece of rubber. A. The mineralogical name of the article is itacolumite; its composition is expressed in the term flexible sandstone. The quality of flexibility is due to the arrangement of the grains of saud.
  - (34) G. J. Van D. writes: 1. In the Scien-TIFIC AMERICAN, April 5, answer 43, you say: "Add abouthalf an ounce of bigulphate of mercury to every 5 pounds of solntion." What is the result accomplished

electrotyping, to make bronze ornaments? One that water. Cork tight, and set aside for several days, and will run sharp in plastic moulds and melt at a lowtemperature, i. e., over a gas stove? A. We would recommend the use of type metal as suitable for your pur-

- (35) C. C. B.—In order to prepare carmine, 1 pound of cochineal is boiled with 4 drachms of potassium carbonate in 71/2 gallons of water for fifteen minutes. Remove from the fire, stir in 8 drachms powdered alum, and allow to settle for twenty to thirty minutes. Pour the liquid into another vessel, and mix in a strained solution of 4 drachms isinglass in 1 piut of water; when a skin has formed upon the surface, remove from the fire, stir rapidly, and allow to settle for one-half hour, when the deposited carmine is carefully collected, drained, and dried.
- (36) P. J. N.—'The following is a crimson stain that is frequently used for musical instruments: Ground Brazil wood 1 pound, water 3 quarts, cochineal 1/2 ounce; boil the Brazil wood with water for an hour, when it will be fit for use. This is first applied, and ½ gallon; add 6 ounces gum sandarac, 3 ounces gum mastic, and 1/2 pint turpentine varnish; put the above in atin can by the stove, frequently shaking till well dissolved; strain, and keep for use. If you find it harder than you wish, thin with more turpentine varnish.

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

D. W.-1. Pyrite, or iron sulphide. 2. Calcite, crystallized calcium carbonate. 3. Is a compact sandstone. There is no stillbite or chabazite among the specimens received.

#### INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

May 6. 1884.

#### AND EACH BEARING THAT DATE.

8-	[Connetes ton doffict about soules of these notants ]
ly	[See note at end of list about copies of these patents.]
aе	Alarm. See Burglar alarm.
en	Alarm lock, R. G. Vassar
ıd	Annunciator, electric, P. Seiler
ed	Asbestus compound and articles made therefrom,
-	C. F. Brigham
	Aspirator, surgical, C. B. Hardin
e	Axle box, car, J. W. Carr
be '	Axle box, car, G. W. Stewart
70	Axle box, car, D. S. Stimson
m	
a	Bag. See Traveling bag.
to	l = 1
	D
đ.	Done hall M. D. Marrian
<b>o-</b> i	Pasin anamalad iron wash Coobran & Milliagn 907 907
es	Battery. See Galvanic battery.
el	Bearing for shafts, spindles, etc., S. J. Howell 298.207
is	Bedstead wardrobe E Nash 298 112
d,	Bedstead, wardrobe, E. Nash
to	Belland annunciator, electric, J. D. Gilchrist 298,080
	Rellows J S Williams 298 261
- 1	Bellows, J. S. Williams
C	Belt gearing for machinery, J. H. Cromie 298,291
	Belt holder, machine, W. R. Santley
nı	Berth, ship's, Milligan & Killion
- 1	
2.	Bitycle step, G. F. Harwood
8.	Billiard cue and walking cane, combined, W. G.
$ \mathbf{n} $	Morse
в, І	Blind, window, H. Brotherton
ĺ	Blotting pad, E. A. Scribner
. !	Book rack, J. Swartz
1-,	Books with wire staples, machine for stitching,
r-	E. Preusse
а	Boot and shoe heel blanks, machine for concav-
Le !	ing, W. Y. Ober
٠.	Boot crimp, F. M. Bratton
r,	Boot or shoe insole, T. Bolton 298,278
1;	Bottle holder, E. R. Richards 298,283
t-	Bottle stopper attachment, C. H. Bennett 298,273
d	Bottling and shipping can, combined, C. R. Peas-
e'	lee
is	Bottling machine, J. C. Blair
у	Bracket. See Pulley bracket.
Ž.	Brake shoe, C. F. Brigham
	Breast and skirt supporter and shoulder brace,
8	combined, M. Clarke 298,067
r	Brush, paint, J. F. Bowditch 298,166
e	Bung, A. G. Anderson
n	Burglar alarm, R. G. Vassar 298,137
-	Burner. See Gas burner.
e	Button, J. F. Atwood 298,154
b'.	Button, N. B. Hale 298082
t	Button, collar, G. Krementz 298,303
۱,	Button fastener, R. Sanford 298,316
	Button feeding apparatus, Hawkins & Wood-
e	ward
١,٠	Buttonhole, E. G. Harris 298,198
1	Button, separable, Robinson & Lallement 298,286
t	Button setting instrument, J. F. Atwood 298,155
-1	Button setting machine, Hawkins & Woodward 298,200
4	Cables, gripping and crossing, R. Ramsden 298,312
t	Can. See Oil can. Paint can.
٤:	Can, W. Harris 297,990
ź t	Cane juice, apparatus for extracting, G. B.
-	Boomer
	Canister and mill, combined coffee, E. Norton 298,017
	Car coupling, E. M. Bates
-1	Carcoupling, A.B. Fiske
١.	Car coupling, J. P. Lancaster
,	Car coupling, F. F. Lutz 298,005
·i	Car coupling, S. B. Mayfield
;	Car coupling, N. J. Skaggs
-	Car coupling, G. W. Sowles
-	Car coupling, L. & G. P. Stebbins
	Car coupling, S. B. Zimmerman
	Cars, detachable compartment for, E. S. Henry. 298,086
1	
۹l	Cars, safety bridge for railway, B. L. Ferris 298,075

 Cars, safety bridge for railway, B. L. Ferris.
 298,075

 Carburetor, L. C. Beebe
 298,068

 Card or ticket holder, H. Willson
 298,048

Carpet stretcher, Dunnell & Smith. 298,074
Carriage top, Buchholz & Morris 297,968

332		~ N N 11 1 N N	**	
Cart, road, C. H. Straight	5	Insulating material, D. H. Dorsett	298,07	
Cash transmitter, H. Gazaille Centrifugal separator, J. J. Hendrickson Chain link blanks, machine for making, L. McGil-	. 298,077 . 297,994	sion jack.	. 298,10	0
vray Chair. See Folding chair.	. 298,220	Joiner's clamp, F. Restorff  Jug, sheet metal, R. Shaw	. 298,02 . 298,24	4
Check and draft, bank, J. K. Cleary	298,034	Ladder, Milligan & Killion	. 298,013	3
Churn dasher, S. M. Tilson	. 298,042	Lampholder, incandescent, E. Weston Lamp, incandescent, E. Weston	. 298,32	5
Clock, secondary electric, Himmer & Weisgerber. Clocks, circuit closer for electric, V. Himmer	. 298,205 . 298,301	Lamps, testing carbon conductors for incandes cent, E. Weston	- . 298,14	1
Cook bucket, C. Cook	298,062	Lawn tennis implements, case for, G. E. Shepard Lever press, differential, A. Duchscher et al	. 298,12 . 298,18	<b>5</b> 8
Collar, horse, C. A. Pettie	298,126	Lifting jack, T. Maxon		7
Condenser for steam and smoke, J. M. Carver Conveyer apparatus, Blickensderfer & Smith, 293,274 to	297,969	Owen Locking nut, G. W. Sampson (r) Locomotive frame forging die, T. Morris	. 298,114 10,47	6
Cooler. See Water cooler. Copying and engraving machine, automatic electric, A. Schmid		Locomotive furnace, B. Sloper Locomotive wheel. J. H. Mann. Lubricator, G. McNeil	298,24° 298,00°	7 7
Cotton gin gearing, C. C. Warren Cotton press, J. D. O'Daniel	298,324 298,226	Mail bag catcher, W. H. Lockwood	298,210 298,202	6
Counter seat, A. E. Francis		Mash tuns, false bottom for, G. G. Cave  Medical compounds, preparing, H. C. Lawrence  Metals in ammoniacal solutions, dissolving, C. R.	298,000	
Cross-head, G. H. Corliss	298,035	A. Wright Meter. See Rotary meter. Mill. See Roller mill. Saw mill.	298,149	<b>)</b> !
for overcoming, I. L. Hawkins  Deodorizing and antiseptic water closet cover, F. H. Hubbard	298,199	Miter box, J. Cashin		
Derrick, C. T. Day	298,184 298,210	Motion, device for converting, C. Bernhard Motor. See Electric motor. Hydraulic motor.	298,160	
Ditching machine, M. Milner Dividers, R. Folger. Drawers, J. M. Cox.	297,979			
Drawers, J. C. Tracey	298,322	Neckwear tip, W. Fichtenberg.  Nippers, police chain, E. D. Bean.  Oil can, R. English.	298,190 298,158	) } <sub> </sub>
Drill and countersink, combined, A. J. Smart Easel, T. C. Vail	298,257	Overshoe, E. A. Saunders	298,239	) :
Electric circuit closing device, automatic, C. T.  Ross  Electric circuit connector, E. Weston		Paint can, E. Norton Paint distributer, L. Walkup Paper bag, soft tie, J. Arkell	298,138	3
Electric motor, I. W. Stockwell Electric wires, laying underground, J. H. Page Electrical circuit treaker, E. Weston.	298,020	Paper bags, making soft tie, J. Arkell	298,134	
Elevator, W. J. M. Dobson	298,187 298,331	& W. Moorhouse Pen holder, S. A. Holman	298,108 298,090	)
Embroidery, M. H. Pulaski Embroidery, velvet and plush, Bally & Hartmann Engine. See Steam engine.	298,053	Pen, stylographic fountain, Haring & Court Pianos, device for cutting damper felt for, J. Swenson	298,040	1
Engines, utilizing the exhaust of, D. Renshaw Engraving machines, ring and watch case attachment for, A. E. Francis	i	Pill forming machine, A. H. Wirz		1
Erasercase, L. Krob	298,096 298,211	Pipe, curved, J. F. Bennett	298.059 298,294	İ
Feed water heater, C. H. Magoon	298,105	Angus	298,269 298.139	
Fences, machine for manufacturing, G. H. Shellaberger		Planter check rower, corn, C. S. Locke	298,157	Ì
Fencing etc., twister and spooler for the manufacture of wire, O. P. Briggs	298,280	Potato digger, S. D. Brown	298,064 298,022	İ
Fertilizer pulverizer and distributor, C. F. Dinkle Filing-papers, device for, J. C. Lang	<b>298,186</b> :	Power. See Tread power. Power, device for transmitting, J. A. Sherman		i
Fire and water proof material for roofing, etc., C.  b'. Brigham		Press. See Cotton press. Lever press. Seal press.  Printing machine inking mechanism, G. A. Wil-		
Fire escape, C.B. Anderson	298,266 298,292	son	298,092	
ard	298.163	Printing press feed guide, J. Blocher	298,164	i L
Floor and ceiling for buildings, fireproof, J. O'Friel		Rios  Propelling canal boats, G. R. Taylor  Puddling furnaces, cooling shield for, E. W.		
	297,972	Hickman	298,241	:
Font and poor box, combined holy water, J. J. Brennan	297,966	Pump fixture, chain, A. S. Wright	298,330	,
Frame. See Screen frame.	298,232	Railway rail, T. Breen	298,209	ļ,
Furnace. See Locomotive furnace. Regenerative furnace. Steel melting furnace.  Furnace grate, Jewell & Mathisen	ì	Railway switch signal, Alexander & Wheelhouse. Rake, W. Barry	298,156	
Galvanic battery, C. L. Clarke Game, R. B. B. Foote Gangway forships, T.I. Knight	298,175 298,192	Refrigerating car and chamber, E. Hamilton Refrigerative furnace, J. W. Galvin	298,083 298,297	:
Garment clasp, C. C. Shelby	298,031	Ring. See Jewelry ring. ttock drills, pipe casing for submarine, C. A. Sterling		
Gas burner, A. B. Lipsey Gas burner, cut-off, A. C. Austin	298,215 298,052	Robe holder for vehicles, G. H. Chappell	298,173 298,206	
Gas generator, L. C. Beebe	298,076	Rotary meter, J. A. Peer	298.095	-
Gate, A. H. Staring	298,037	Sash fastener, R. McCabe	298,115	i ,
Glass, flatting and annealing oven for, T. A. Zellers	298,332	Saw mill, circular, W. J. F. Liddell (r)	10,474 298,195	ı - 1
Glove fastening, W. F. Foster	297,961	Scale, E. R. Puffer		(
Grindstone shaft, A. F. Weaver		Screen frame, G. Phillips	298,168	[
Halter strap fastening, J. Gibbons	297,983	Seaming plush back fabrics, L. S. Cox		1
Harness, swiveling loop iron iron for, Mackay & Dunn	298,008	separator. Separator for peas, etc., B. D. Gladney Sewer trap, T. Watkins	298,045	ļ
Harvesting machine, grain, Barnhard & Thomas.  Hat roll pressing machine, Gilman & Weiker  Hay stacker, W. Louden	297,984	Sewing machine, buttonhole, J. H. Palmer  Sewing machine, cabinet, J. Bolton  Sewing machine. carpet, A. B. Smith	298,277	] ]
Heater. See Feed water heater. Hoe, wheel, S. Fuller	298.296	Sewing machine for brace wiring hats, M, H. Ryder		
Holdback hook, C. L. Crowell  Holder. See Bottle holder. Lamp holder. Paper holder. Pen holder. Bobe holder.	- 1	Sewing machine ruffling and gathering attachment, L. Onderdonk		· ! ]
Hook. See Holdback hook. Hoopsplittingmachine, I. Walborn Hose coupling, A. Zoller	298,044 298,150		298 <b>,25</b> 8 j	] [ ]
Hose, fire, G. A. Stuck	298,321 298,014	Shade fixture, G. W. Steele	298,128 298,004	2
Hydraulic motor, R. Leuchsenring	298,102	Shaft coupling, T. E. & J. P. Golden		! 
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	Sheet metal vessels, handle attachment for Krippendorff & Marsh	۲,	
00	Sheller. See Cocoanut sheller.		
	ford	. 298,2 <b>6</b> 0	
14	Ship's hull and propeller, Z. Oram	. 298,019	•
3	Shirt, S. Conde	. 298,178	3
2	Show case, T. F. Curley	. 298,189	3
3	Sickle grinder, C. W. Claybourne	. 298,176	3
	Skate, róller, C. F. Morse	. 298,110	,
7	Slate, school, W. D. Hever	. 298,3°23 . 297,996	•
5	Slotting machines, tool oscillating device for, J	298.267	1
	Soda, obtaining, J. Townsend	. 298,256	i
	Soda water apparatus, A. Bertelli	. 297,993	١.
46	Spark arrester, J. S. Park	. 298,229	Ġ
9	Spoon, J. Bergfels		
7	Spring. See Vehicle spring. Spring and weight motor, A. Lewis	298.001	į
1	Station indicator, H. E. Bissell	. 298,162	
6 2	E. Wright	. 298,049	I
2	Steam engine, W. Golding Steam generating apparatus, W. A. Pentecost	. 298,081 . 298,024	1
9	Steel melting furnace, open hearth, C. M. Ryder	. 298,028	
đ	Stone and marble, manufacture of artificial, H A. Daniels	. 297,971	
0	Stone dressing machine, N. J. Swayze	. 298,132 298,026	į
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9	fellow Sugar and sugar masses, method of and appara	•	J
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	for, A. L. Gates	298,196	
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)	Tombstone picture case, Holloman & Green Toothpick device, J, Hoffman		
	Toy, J. A. Crandall	298,289	1
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l	Trrch clearer, W. Dunbar Traction engines, steering gear for, A. P. Broom-	298,295	!
	ell	298 <b>,169</b>	
,	Trap. See Sewer trap. Traveling bag, C. A. Zinkand		
	Tread power, E. Kilbourn  Trunk, E. Wilson	298,094	1
	Trunk or box fastener, E. W. Brettell	298,279	
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	Valve gear, steam engine, O. F. Howard	297 <b>,997</b>	1
	Valve, puppet, H. F. Frisble	298,194 298,016	
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I	kins	297,992	
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!	Water, purification of, A. R. Leeds		t
j	Whiffletree, E. R. Annable		i
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