### Business and Lersonal.

The Charge for Insertion under this head is \$1 a Line.

Steam Yacht for Sale 60 ft. long 25 horse engine. Beautifully fitted up. Address H.L. R. 40 West 18th St. New York.

For Sale—"The Metzler Patent Spring Leaping Horse"—or the right to manufacture on royalty. Address. G. E. C., Lock Box 31, Danbury, Conn.

To Machinists, Boiler Makers, and Engineers. Wanted a position as superintendent by a Boiler Makerwho would invest \$5000 if desired with services; has twenty years experience, eight years as an employer. Address M. C., Mott Haven P. O., Westchester Co., N. Y.

Machinists-See adv. of Cold Pressed Nut Factory, page 173.

Double Engine Link reverse cylinders, 4 by 6for \$400. Geo. F. Shedd Waltham, Mass.

Steam and Water Packing Manufactured by The Manhattan Packing M'f'g Co., 15 Frankfort St. N. Y. This Packing is superior to any in the Market.

Buy Boult's Pat. Molding and Dovetailing Machine, for all kinds edge and surface molding. Battle Creek Machinery Company, Battle Creek, Mich

Best Steam Fire Engine or Hook & Ladder Signal Lamps. Apply to White M'f'gCo., Bridgeport, Ct. A Condensed Treatise on Silicate or Soluble Glass just published and mailed free on receipt of \$1. L. & J. W. Feuchtwanger, 55 Cedar street, N. Y.

Chemicals of all kinds for all trades made to order at our own Laboratory by addressing L & J. W. Feuchtwanger, Chemists, 55 Cedar street, N. Y.

A Machinist and a Moulder with a small capital can form a partnership to a good advantage. Address Letter Box 252, Knoxville, Tenn.

Wanted.—A machine to take burs out of wool. J. M. Ferguson, 162 Front st., New Orleans, La. For Inventions or Improvements to facilitate your manufacturing and labor, address S. E. Harthan, Worcester, Mass.

The Olmsted Oiler is the best; it is self righting, strong and cheap. All Hardware and Tin Houses have it.

Mining, Wrecking, Pumping, Drainage, or Irrigating Machinery, for sale orrent. See advertisement, Andrew's Patent, inside page.

Key Seat Cutting Machine.T.R.Bailey & Vail.

Portable Hoisting and Pumping Engines— Ames Portable Engines—Saw Mfils, Edgers, Purr Mills, Climax Turbine, Vertical and Horizontal Engines and Boilers; all with valuable improvements. Hampson Whitehill & Co., Newburgh Steam Engine Works, Depot 38 Cortlandt Street, New York.

Lathes, Planers, Drills, Milling and Index Machines. Geo. S. Lincoln & Co., Hartford, Conn.

Scale in Steam Boilers — How to Remove and Prevent it. Address Geo. W. Lord, Philadelphia, Pa. Williamson's Road Steamer and Steam Plow withrubber Tires. Address D. D. Williamson, 32 Broad way, New York, or Box 1803.

Belting—Best Philadelphia Oak Tanned C. W. Arny, 301 and 303 Cherry Street, Philadelphia, Pa. For Solid Emery Wheels and Machinery send to the Union Stone Co., Boston, Mass, for circular

All Fruit-can Tools, Ferracute, Bridgeton, N.J. For best Presses, Dies and Fruit Can Tools Bliss & Williams. cor. of Plymouth & Jay, Brooklyn, N.Y. Root's Wrought Iron Sectional Safety Boiler.
1,000in use. Address Root Steam Engine Co. 2d Avenue and 28th Street, New York.

For Sale—A Walker Bros, Percussion Mill for pulverizing hard substances. Thos. Waring & Bro., Colora, Cecil Co., Md.

Stave & Shingle Machinery. T.R.Bailey & Vail.

Five different sizes of Gatling Guns are now manufactured at Colt's Armory, Hartford, Conn. The larger sizes have a range of overtwo miles. These arms are indispensable in modern warfare.

Machinists—Price List of small Tools free; ear Wheels for Models, Price List free; Chucks and Drills, Price List free. Goodnow & Wightman, 23 Corn hill. Boston, Mass.

For Solid Wrought-iron Beams, etc., see advertisement. Address Union Iron Mills, Pittsburgh, Pa., for lithograph, etc.

Bookkeepers should try the Olmsted Patent Bill file and Letter Clip. They are admirable for all papers. Savetheir cost in one day's business. Sold by all Stationers, J.H. White, Newark, N.J., Sole Manufacturer.

To sufferers from batteries that get out of order on Burglar Alarms, etc., the Leclanche Battery Co., 40 West Eth st., New York, guarantee these batter-ies to last one year without any attention.

Buy Gear's Improved Car Boring Machines

The New Remedy retains the Rupture in ease and comfort, night and day, till cured. Sold cheap. Fitted without charge, by the Elastic Truss Co., 683 Broadway. For Sale—3 Pat's at less than half their value two for Impr'ts in advertising Lanterns, one for Impr'ts in Envelopes, by S. Kuh, Jefferson, Iowa.

Hydraulic Presses and Jacks, new and sec-

ond handl. E. Lyon, 470 Grand Street, New York

Sure cure for Slipping Belts—Sutton's patent Pulley Cover is warranted to do double the work before the belt will slip. See Sci. Am. June 21st, 1873, Page 389. Circulars free. J.W.Sutton, & Liberty St., N.Y. atalogue on Transmission of Power by Wire Rope. T. R. Bailey & Vail.

Bolt Makers, send for descriptive cuts of Abbe's Bolt Machine, to S. C. Forsaith & Co., Manche

Mills for Flour, Feed, Paint, Ink, Drugs, Spices and all other purposes. Ross Bros., Williamsburgh, N.Y.

Nickel and its Uses for Plating, with generaldescription. Price 50c. a copy, mailed free, by L. & J. W. Feuchtwanger, 55 Cedar St., New York.
Silicate of Soda and Potash—All grades, in

liquia, jelly, and dry state, for sale in quantities to suit, by L. & J. W. Feuchtwanger, 55 Cedar St., New York.

Parties desiring Steam Machinery for quarrying stone, address Steam Stone Cutter Co., Rutland, Vt. Boring Machine for Pulleys—no limit to pacity, T. R. Bailey & Vail, Lockwort, N. Y.

Brown's Coalyard Quarry & Contractors' Apparatus for hoisting and conveying material by iron cable W. D. Andrews & Bro. 414 Water st.N. Y.

The Best Smutter and Separator Combined in America. Address M. Deal & Co., Bucyrus, Ohio.

Damper Regulators and Gage Cocks—For the best, address Murrill & Keizer, Baltimore, Md. Steam Fire Engines, R.J. Gould, Newark, N.J.

Gauge Lathe for Cabinet and all kinds of handles, Shaping Machine for Woodworking. T.R. Bailey & Vall, Lockport, N. Y

Peck's Patent Drop Press. For circulars, deress Milo, Peck & Co., New Haven, Conn.

Machinery selected by Gear, Boston, Mass. lways gives satisfaction Cabinet Makers' Machinery. T.R.Bailey&Vail.

For Sale—Patent for combined tap & screw wrench. John Hackett, Machinist, Morgan and Warren Streets, Jersey City, N. J.

For Sale-Entire right of three Patents small articles, iron or steel-useful in all families. Address A. Thayer, 307 Hamilton Street, Albany, N.Y.



L. S. asks: Photographs can be taken on paperwhich has been dipped in asolution of bichromate of potash, but the shades are not dark enough. How can I make them darker?

J. H. C. says: I have an eye stone (as described by Mr. J. Stauffer on page 131, current volume), 31/2 inches in circumference. Where could it have come

J. H. P. asks how small brass castings, such as keys, are made, and is it possible to cast more than one key in the same mold? If so, how is it best done?

J. C. P. asks: How is gold leaf put on books, leather, etc.?

D. U. B. says: I have varnished (copal varnish) and polished some tiles made from Portland ce ment. About 20 daysafter finishing, there came out on he surface a great many small blisters. Can any one suggest the cause and the remedy?

A. G. S. asks: How can an oval cylinder be bored on a lathe, if the shaft be in the center of the cylinder?



O. B. will find a recipe for a cement for mending leather shoes on p. 129, vol. 28.—E. E. T. can cast brass by following the directions on p. 231, vol. 26. -N. D. can weld iron and steel by the method described on p. 381, vol. 26 .- T. G. S. should follow the directions on p. 41, vol. 23, for gilding names on china.—F. H. B will find a system of filtering described on p. 241, vol. 27.

L S. asks: 1. Will a bar of iron, suspended by the middle, sustain less or more weight if we groove it the whole length, so as to make the sectional area of n of shape? 2. If it is made of cast iron, and malleable ized, will it sustain as much weight as when made of wrought iron? Answers: 1. Less. 2. No.

W.P. asks: Which is the preferable way to heat a medium sized greenhouse (where coal averages from five to six dollars a tun), steam, hot water or simply by carrying the smoke along the floor in a brick flue? I care more for the good of the flowers than the first cost although that is also an object. Answer: The best plan is to heat by means of hot water pipes. The cheapest method is to conduct the fire through a flue, along the ficor. The portion of the flue nearest the fire, say for 30 feet, should be of fire brick; the remainder may be made of drain pipe.

J. W. says: I am told that a pipe } inch in diameter and 20 feet long, the end of which is inserted in the bung hole of a barrel, if filled with water will burst the barrel. Suppose that the pipe were 2 inches diameter, and 10 feet long, if filled with water; would it have the same effect? Answer: The pressure on the barrel would be only half as much, in the second case.

W. S. C. says: I am running a 12 horse power threshing machine, in which the power is con-nected to the drum by means of the ordinary coupling rods. Can I gain any power by applying a belt in the place of the coupling rods, allowing the power the same distance from drum and giving the drum the same speed? Answer: We think not, but would be pleased to hear from any of our readers who have tried the experiment

H. S. H. says: An oscillating engine has wo cylinders one inch in diameter x two inches stroke. How large and how thick should a boiler be to carry a working pressure of 100 lbs. and run at 350 per minute? Answer: Allow from 10 to 12 square feet of heating surface; and if the boiler is cylindrical, with riveted joints, and made of copper, the thickness in inches may be found by multiplying the diameter in inches by 0 002917. If the boiler be made of wrought iron, multiply the di ameter in inches by 0.001786.

J. A. H. asks: In the exhibition of Pepper's "ghost," do the rays of light forming the ghost's image come from the front surface of the glass plate (according to the laws governing all rays having an incidence of 50 degrees or less) or do they come from the back surface of the glass according to the laws of total reflection orrefraction? Answer: The rays come from the front of the glass, in reality, but apparently from behind.

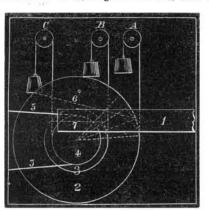
W. K. asks: What is the cause of tubes in a boiler blistering? I amrunning two tubular boilers they became red hot last summer and scaled off to a depth of % inch. I used an anti-incrustation powder, and now the old scale is coming off and the tubes show blister. Is it on account of overheating? Answer: The tubes were in all probability blistered from overheat, the scale preventing contact with the water.

D. C. asks: 1. What is the most intense neat that can be got from a blacksmith's fire, fitted with a blower, in degrees Fahrenheit? Which is the most powerful mechanical power? Answers: 1. About 3,800° 2. In practice, you can probably increase pressure to the greatest extent with the screw.

J. W. S. says: On page 66 current volume in speaking of the lecture of Dr. Thomas before the Nautical School in New York, he is reported as having said as follows: "The Lapland, which sailed from Eng-land one day after the City of Washington, carried such an instrument (the palinurus), which showed that during the appearance of the aurors borealis, her compass deviated 140. This deviation, occurring, asit must have done on the City of Washington, at the beginning of her voyage, would cause her to diverge 20 miles from her course in every hundred," etc. Is there not a mis-take in the Doctor's statement concerning the deviation and divergence? Would not the divergence at 1%° deviation of compass be but about 2.62 miles in 100 instead oi 20 in 100; or would it not require about 11°28' of deviation of compass to cause 20 miles of divergence in 100? Answer: On the principle of plane sailing: Departure=distance×sine of course, which will make your calculations about correct.

J. B. asks: Why does gas in a stove ex-clode, making areport like a musket and blowing the dust over the room and filling the house with gas? Sometimes a flame will flash out, two or three feet from the bottom door, and people are sometimes baily burnt. These explosions take place when the fire is first built or immediately after fresh coal has been put on. They are more common when red ash or Franklin coal is used but will take place with the hardest coal. Answers The cause of the explosions alluded to is the combustion of carbonic oxide, a compound of carbon and oxygen. The blue flame over the surface of newly made coal fires s due to the combustion of this gas, which is always formed when hard coal burns with a limited supply of oxygen, or when carbonic acid, formed by the combus tion of the red het coal below, comes in contact with the hot coal above in an ordinary close stove. Reversing the draft, that is, carrying it from above down through the feed coal and out at the bottom of the grate, would probably prevent any explosion.

J. E. E., of Pa., says: As A. W. I. differs withme in myreply to H. B. as to the relative power required to drive two circular saws, one just large enough to cut through the timber and one larger. I give he following explanation, admitting that certain con ditions may favor his theory. The accompanying dia-gram shows two saws, respectively 30 and 60 inches diam-eter. The teeth in the 30 inch saw will be only half the distancefrom point to point of those in the large saw and the teeth in each saw being of the same size, pitch and length, the small saw will have only one half of the space between the teeth that the large saw has. In case the feed is very heavy, so that, in the small saw, there is not space between the teeth sufficient to contain the sawdust without clogging, then the large saw would have a decided advantage, as the dust room would be twice as large. The track cut by the small saw is greater thanthat cut by the large one, and more cutting points are in the timber at the same time, cutting more length wise of the grain than the large saw; while the teeth of the large saw are running at greater velocity at the ex-pense of power. If, for example, we run a 12 inch saw 1,000 revolutions per minute, by a 6 inch pulley, and saw through a 4 inch cut, and we put a saw5 feet in diameter on to the same mandrel at the same speed, and with the same number of teeth, a very wide difference in favor of the small saw will be observed at once; as we bring the saws nearer to each other, in size, the difference in the power is not proportionately as great; still there must be and is evidently a difference. There is more or less friction of the timber against each saw, which is



Scale 14 inch to the foot. 1, stick of timber 12 inches through. 2, circularsaw 60 inches in diameter. 3, circularsaw 60 inches in diameter. 5, 5, 5, driving bet. 6, pitch line drawn to 4 the diameter of saw. 7, pitch line twan to 4 the diameter of saw. 7, pitch line twan to 5 the diameter of saw.

evidently infavorof the smaller one. It will be observed on reference to the above diagram, that with the same pitch of teeth (and I have drawn each to a one fourth pitch) the teeth of the two saws are presented to the wood quite differently. The large saw presents the teeth with more hook than the small one. A represents a weight, attached by a cord to the edge of the large saw, B a weight attached to the edge of the small saw, C a weight attached to the pulley face, or one foot from the center of rotation. Now supposing the weight C to weight,000 lbs., a 500 lbs. weight at A would raise it, while it would require about 800 lbs. at B. Now detach the weight-Aand B and apply the teeth of each saw one inchinto a 12 inch stick at one turn; which saw will re-quire the most weight, provided in each case that the points of the teeth only come in contact with the tim-ber? I hold that the smaller saw will require the lighter weight. There may also be conditions when a larger number of teeth will require less power than a less number; on very heavy feed, where each tooth would be overloaded so that it would require a great amount of power to crowd it through the timber, if each tooth in a circular saw cuts one twelfth of an inch of timber (which is an average for a board circular saw) it cer tainly will require more power to cut each chip. A saw may be too coarse or too fine toothed for the work required. Practice directs the carpenter how to set the cutting tool of his plow or jack plane in order to accomplish the most with his muscle; and it will do so with

R. F. H. asks: How can I make Javelle ater? Answer: Put 4 lbs. bicarbonate of soda in a kettle, add 1 gallon water, and boil for 15 minutes; then stirin 1 lb. chloride of lime, free from lumps. Use cold.

W. E. asks: With small turbines running under a head of 90 feet or more, do the buckets ever become heated by the action of the water vpon them? Ifso, why? Answer: It will depend upon the construc tion of the wheel, whether the water has a free exit or not. A simple experiment (taking the temperature of water before and after discharging) would settle the matter for any particular case.

C. H. M. asks: If I multiply the number of square in chestin a boiler by the pressure, shall I get the aggregate pressure in same? To illustrate: A boiler is 40 inches diameter x 10 feet, long inside, and the pres sure is 70 lbs. shown by steam gage. What would the total pressure be? Answer: If you mean the pressure tending to produce rupture, it may be calculated in the following manner: Area on which pressure acts  $=40\times10\times12=4,800$  square inches. Total rupturing pres $sure=4,800\times70=296,000$  pounds.

G. B. M. asks: 1. Why is it that with all the iron and coal that there is in this country that so much of our railroad iron and machinery comes from England? Is it because it is cheaper there, or are they better workmen than we are? 2. Please name some of the works on electricity and electrical apparatus. An swers: 1. Because it is cheaper. Wages are much less in Europe than in this country, but we do not think that the workmen abroad are any better than our own. 2. We can recommend Noad's "Text Book of Electricity.'

S. D. P. Jr. asks: 1. I would ask your opin on in regard to a boiler which I am using, making steam for boiling stock and drying paper. Said boiler is about 25 years old, never has been patched, is 52 inches by 10 feet, with 70 (I think), 3 inch copper flues. I usually carry about 25 pounds to the inch, it blows off at that A short time ago, I tested it by the force pump, pumping n warmwater until the gage showed 42 pounds. although this boiler has been long in use, and, it is to be presumed, has bee ome worn thin in places, would it be advisable to substitute a new one? It is perfectly tight and makes steam freely. On account of the copper flues, I think I get more steam from the fuel than I would from an iron flue boiler. 2. I have heard experienced engineers and boiler makers contend that, when a boilergives out simply from the natural pressure of the steam on some weak spot, there will be no general destruction of the boiler but merely a "blowing out" at that particular place, and that destructive boiler explosions occur from low water or some other unknown cause, and that, under such circumstances, the stronger the boiler the more destructive the explosion. Is this so? Answer: 1. If you have a careful engineer, we would advise you to continue the use of the boiler since from your statements, it would seem to be unusually well constructed. 2. We believe that all boiler explosions occur from what you call the natural pressure of steam. As to the destructive effects of such ruptures, witness the explosion of the boiler of the steamer Westfield, under what is considered a very low pressure of steam. On page 192 of volume XXVIII of SCIENTIFIC AMERICAN, you will find an article giving our views on explosions from low water.

J. T. M. says: In Dick's "Practical Astronomer" there is a description of a new achromatic tele scope, in which a small compound lens is made to correct the chromatic aberration of a large crown lens, by which the necessity for a large flint lens is done away with. The inventor, I believe, was a Mr. Rogers. The compoundlens was to be made of crown and flint, so as to lengthen the focus for violet rays and shorten that for red. Now the large objections would bring the violet to a shorter focus than the red, but, melting the compound glass, the first is lengthened and the second short-ened so as to come to a focus together. The proper adjustment of the compound lens for this correction is effected, not by regulating its radii, but by placing it nearer or farther from the object glass. I would like to know: What is the defect in this combination, that it has not been adopted in the construction of achromatic monarrangement? 2. How high a power would a three inch crown object glass, with a 1½ inch compound lens, bear? 3. Would a small achromatic lens do for the compound lens; and if not, how is this lens to be construct ed? 4. Would you advise me to attempt the manufac-ture of such a telescope for my private use? Would it be worth the trouble? Answers: 1. Large fint disks forlenses are now sold at the same price as those of crownglass. The contrivance you mention does not properlycorrectthe spherical aberration; the small lens being one quarter the size of the crown objective, must befourtimes as accurately figured. 2. About 200. 3. No The late Mr. Fitz made thorough trial of the Barlow fluid lens, of bisulphide of carbon between meniscus cheeks of glass. 4. No. A glass reflector.silvered, then nickel plated and polished, costs little and is the only telescope which can be cheaply made by an amateur See our remarks to C. M. P. on page 43.

L. S. asks if landscape painters do not use a mirror which reduces the object to the size required Answer: They sometimes do use a mirror. A sheet of glass blackened on one side makes a good reflector for this purpose. But a still better device is a camera oscura, which consists of a lens set in a box, something like a photo camera. In this instrument a reduced image of the landscape is thrown upon ground glass or upon tracing paper, and a drawing of the view may be eadily made.

W. J. W. asks: What is the process of bleaching india rubber? Answer: One process consists in heating the rubber with ammonia and phosphate of lime. Another consists in treating the rubber with chlorine and washing it with hot water, then hardening by means of phosphate of lime.

W. H. T. asks: 1. When a locomotive is rounding a curve, which rail sustains the greatest weight, the outside or inside? 2. Which of the wheels slips, or how is the difference in length of rail over-come? Answers: 1. If the outer rall is elevated, the inner sustains the greatest weight. 2. If the wheels are coned, neither may slip; but if not, the one that describes the longer curve will slip.

M. W. asks: 1. What causes type metal to be porous, or to have small holes on the face? 2. At what heat will antimony fuse? Answers: 1. The cause of your type metal having a porous face is probably imperfect casting. 2. Antimony melts at 842° Fahr.

C. S. asks: Is there any ingredient that can be mixed with pine tarso as to give it a yellow color when tarring any dark fiberous material? Answer: You can tryyellow ocher.

C. D. S. asks: What is the philosophy of the gyroscope, and what is that instrument used for? What keeps it in a horizontal position? Answer: The weight is sustained by reason of its inertia, or by virtue of the principle that rotating bodies tend to preserve their planes of rotation. This is the best explanation that can be given with out the aid of a mathen atical inits principal use is to illustrate astronomical phenomena

J. P. G. says: I wish to know to what uses apstone can be applied. I understand that it is used (1) as a lining for furnaces, stoves, etc.; (2) when ground powder, as a facing formolds for fine castings; (3) as a fertilizer. Answers: Steatite or soapstone is used for a variety of purposes, chiefly (as far as we know at present) those that you have mentioned, except as a fertilizer. A line or two in our Business and Personal column will introduce you to the buyers of it.

J. H. S. says: There are in this place several engines that are mysteries to me. The trouble is a creaking noise in the feed pipe, in some netween the pump and boiler, in others just back of the pump. The clicking noise is so bad at times as to cause fears of the pipe breaking. Can you tell me the cause of the noise? Our pump is connected to the cross head and runs at 110 strokes per minute. I stopped the noise on one pipe by putting in a piece of rubber hose. Answer: Without seeingthe rumps and pipes, we can only give a genera reply. This creaking noise is frequently caused by leaks in the pipes, and engineers know very well that noises around machinery generally originate in very different places than those from which they seem to proceed. It is easy to see how putting in a piece of rubber hose would prevent the noise, since you have replaced a good conductor of sound by a bad one,

W. W. H. asks: Is it strictly proper to speak of dew as falling? One party contends that dew never forms in the atmosphere and falls to the ground, but is only produced by the moist warm atmosphere coming in contact with the surface of cooler bodies, when the condensed moisture is deposited in the shape of drops of water. Is he philosophically correct? And if so, car you inform me why dew forms on the upper surface of objects only? Answer: It is not philosophically correct to speak of the dewfalling, as one would speak of rain. Dew is the condensed moisture of the atmosphere which collects gradually on terrestrial objects when they become cooler than the surrounding air, and it forms most readily and abundantly on those objects which soonest and most perfectly radiate their heat. On this account, arough surface is more favorable for the deposition of ew than a bright or polished one, and the rough moist blades of grass in the morning are more abundantly covered with dew than dry, dead stalks or a wooden fence. Dew collects on the upper surface of objects because they are more favorably situated for radiating their contained heat to the upper air, and its formation retarded in objects more or less covered by the heat which they radiate being reflected and again radiated back upon them. A cloudy night is unfavorable to the formation of dew, for the same reason.

 $E.\ J.\ asks:\ How\ can\ I\ detect\ lead\ in\ water$  by the use of hydrosulphuric acid? Answer: Reduce by boiling about 5 gallons of the suspected water to a gill orless, and pour into the concentrated liquid a strong clear solution of hydrosulprurte acid, or pass a stream of hydrosulphuric acid gas through the water. If lead be present, the solution will turn dark from the formation of suphide of lead. It may be necessary to filter the concentrated water, as it must be perfectly clear, and the solution of acid as well, otherwise any discoloration may escape notice.

J. M. H. asks: 1. What keeps a hoop or wheel in an upright position while in motion? 2. Is space a created thing or a necessary nonentity? 3. At what temperature does water boil in a vacuum? 4. Is steam condensed at 210° or 211° Fahr. as effectually as when a lower temperature is used? Answers: 1. Its own motion, which it tends to preserve in the same plane in which it was imparted. 2. We would refer you to a good work on metaphysics. 3. In a good well maintained vacuum, water could be made to boiluntil almost the freezing temperature, 32° Fahr. was reached. 4. No, because the tension of water vapor at 211° Fahr. is nearly as great as that of steam at 212° Fahr. The lower the temperature of the condensing water, the more quickly and effectually is the steam

S. B. B.—All papers sent through the mails must be paid. Much obliged for the copy sent.

J. B. says, in reply to G., who asked how to get red ants out of sugar: Get some gum camphor in lumps and secure the separate lumps in small cotton sacks, and attach them to the top of the bins, very near the sugar. If the bins are large, fix a piece of board on Use the camphor plentifully. My experience has been that, in a few days, the ants would leave and not return while the aroma of the camphor lasted.

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

G. W.K .- A kind of clay resembling fuller's earth.

G. W. C.—The enclosed mineral strongly resembles antimony; and if found in sufficient quantity, is well worth a chemical analysis.

J. G. S.—Nos. 1, 2 and 3 are iron pyrites. No. 4 is zinc blende. No. 5 is iron ore. No.6, is galena in calcite. No. 7 is rhomb spar (calcite).

W. A.—The stone sent is carbonate of lime. It seems hardly compact enough for lithographic stone.

B.D. J .- We tasted one bottle of the water sent, and detected iron, but could not perceive sulphur or sulphuretted hydrogen. It might be worth a chemical an-

G. W. B.—Nos. 1, 2 and 3 are claystones. No. 4 is conglomerate. The other is quartz geode.

### COMMUNICATIONS RECEIVED.

The Editor of the SCIENTIFIC AMERICAN acknowledges, with much pleasure, the receipt of original papers and contributions upon the following subjects:

On Jumping from Railway Trains. By A. F.

On Spontaneous Generation. By J. C. W. and by D. S. G.

On the Devil Fish. By C. R. B.

On the Last Railroad Horror. By A. T. On a Canal through Syria. By T. L. F.

On the Locomotive. By W. T. H.

On the Patent Right Question. By C. S. and by J. E. S.

On Meteors. By G. C. T.

On Bisulphide Engines. By J. A. H. E.

On Car Ventilation. By E. M. G., Jr.

On Boiler Management. By A. M. E.

On Electricity. By O. H. T.

On the Great Telescope. By F. M. B. On Flying Machines. By T. B.

On Steam Fire Engines. By J. A.W.

Also enquiries from the following: W. M. B. -P. P. -S. H. - W.T. -C. H. J. -W. H. T. W. A. M. - S. W. G. -M . M. - J. N. H. - N. T. P.

Correspondents who write to ask the address of certain manufacturers, or where specified articles are to be had, also those having goods for sale, or who want to find partners, should send with their communications an amountsufficientto cover the cost of publication under the head of "Busmess and Personal," which is specially

devoted to such enquiries. Two correspondents ask what barytes is worth, and who will buy it? Others wish to know where magnetic iron sand can be obtained? Who are makers of the New Jersey apple gatherer? Who makes heating apparatus using low pressure steam? Which is the best portable gas apparatus? Who makes electric clocks? Who make or deal in mechanical tools? How can we find out how to mix colors for pottery? Who makes hard rub-ber, silvered glass reflectors for lamps, and grain separators? What is used for "stuffing" calf skins? Where cana file-cutting machine be purchased? Makers

#### [OFFICIAL.]

## Index of Inventions

FOR WHICH

Letters Patent of the United States WERE GRANTED FOR THE WEEK ENDING

August 12, 1873,

AND EACH BEARING THAT DATE [Those marked (r) are reissued patents.]	•
Air navigating apparatus, T. Green	
Auger, earth, C. D. Pierce	141,664
Auger, hollow, G. F. Almy	
Axle clips, mode of making, H. M. Beecher Baling hay, device for, L. Doty	141,625
Barrel heads, device for centering, J. J. Ralya	141,816
Bed bottom, spring, J. Pollitt Bee hive, D. Rice	
Beetling woven fabrics, J. Patterson Bell for sleigh shafts, A. E. Taylor	141,725
Boiler, vertical steam, C. M. Miller	141,656
Bolt blank die, F. Van Patten Bolt die, king, F. Van Patten	141,679
Bolt die, clip king, F. Van Patten Bolts, heading, C. Hall	141,680 141.711
Boot channeling machine, Chickering & Tuttle	141,693
Boot heels, burnishing, I.Van Nouhuys Boot heels, finishing, L.P. Hawkins	141,712
Boot sole edges, finishing, H. F. Wheeler Boots and shoes, manufacture of, C. A. Keith	
Boring machine, Moorehouse & Wiegand Bottle stopper, L. G. Chaput	
Box, match, J. Holtz	141,793
Brick macbine, D. J. Hunter	
Bucket, sheet metal, W. Austin Buckle, A. B. Shaw	
Burner, vapor, T. Simmons	141,823
Button fastening, E. S. Wheeler	141,749
Can. oil, J. E. Auld	
Car brake, hydraulic, W. M. Henderson	141,790
Car coupling, Decker & Lee	141,635
Car coupling, A. Langellier	141,846
Car brake, steam and air, Moore & Wyman Car, bolster for railroad, J. Anderson	
Cars, ventilating railroad, J. G. Allen	141,617
Carriage, H. E. Delessert	141,661
Carriage wheel hub, P. Murphy	
Chair, folding, K. Geisler	
Cherry stoner, J. S. Lash	
Churn, A. W. Fuqua	141,709
Churn, rotary, W. H. Bunch	
Coal sifter, L. Tibbetts	141,737
Cock, self-closing, M. S. Clark	141,630
	141,675
Column, metallic, J. L. Piper	141,766
Composition for cleaning glass, etc., W. Rosevelt Cooler, milk and cream, H. C. Baldwin	141,819 141,688
Corn sheller, J. B. Johnson	141,795
Cotton, manufacture of gun, S. J. Mackie	141,654
Cultivator, R.A. Fish	141,707 141,786
Cultivator and plow, combined, L. R. Wright (r). Cutter head, D. C. Allen	
Dashboard, J. S. Campbell	141.758
Door fastener, H. Orcutt	141,724
Dredging machine, B. Boschke  Prill, grain and seed, J. H. Shreiner	141,780
Drill rod coupling. R. A. Clark	141,694 141,760
Drum, heating, J. E. Bartlett	141,641
Engine, rotary steam, S. Gibson	141,710
Engines, lubricating pistons in, S. W. Wickes Equalizer, draft, J. Parker	
Fence, portable, G. F. BecherFifth wheel head die, F. Van Patten	141,7:0 141,682
Fifth wheels milling, F. Van Patten Fire arm, magazine, J. H. Bean	141,683
Fire extinguisher, J. H. Steiner	141,825
Fruit box, C. W. Weston	141,842 141,778
Furnaces, feeding fuel to, C. P. Leavitt	
Gas from petroleum, etc., R. H. Smith	141,732
Gate, nursery, E. A. Tuttle	141,677
Generator, sectional steam, W. E. Kelly	141,798
Generator for rendering fat, V. D. Anderson Gimlet handle, H. S. Shepardson	
Glass furnace, A. Pocheron	
Glass, ornamental window, C. Frederici	114,782
Grate, fire, W. H. Farris	141,690
Harness pad tree, W. H. Taylor	141,835
Harvester rake, S. Clevenger	141,695
Hat tip lining, W. H. M. Pye	141,727
Heelbreasting machinery, V. K. Spear	141,735
Hook and hasp, combined, B. H. Brooks Horses, feed bag for, T. Adams Horseshoer's rest, J. Legg	141,691 141,686
Hose coupling, J. W. Kennedy	141,718
Hose pipe nozzle, F. E. Hall.  Hose, etc., distributing, S. Barton, Jr	141,787 141,620
Ice cream freezer, E. B. Tilden	141,738
Key hole guard, W. H. Taylor Knitting holder, H. P. Joy	141,796
Knitting machine, O. Twombley	

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Letter box, post office, W. H. Tayl Life preserving garment, E. R. Co	or 141,834
Line loop, D. McMillan Locomotive ash pan cleaner, A. C	. Denio 141,769
Log turner, E. Tarrant	141,730
Log turner, S. Torrent	
Loom let off mechanism, J. M. Lin	
Loom shedding mechanism, G. Cro Loom shuttle, J. K. McIntyre	
Magnet, relay, T. A. Edison	
Marble, making artificial, C. F. Ba	rker 141,689
Meat chopper, A. R. Silver	141,73
Mechanical movement, L. V. Lew	is 141,800
Mechanical power, C. Van Derzee.	
Mill for sheet metal, rolling, E. H.	Davies 141,701
Music leaf turner, N. P. Hall Nail, B. T. Nichols	
Oiler, pneumatic, C. E. Decker	
Organ free reed, H. E. Hodgson	
Paint, J. Lucas	
Paper folding machine, C. Chambe	rlain, Jr 5,538
Paper folding machine, A. Washb	ırn 141,742
Photographs, washing, L. V. Moul	
Pipe coupling, A. C. Sweetland	
Pipe elbows, pattern for, J. K. Hor Plane, crozing and chamfering, A.	M Stratton 141,04
Planter, corn, W. Mull	
Planter, cotton, R. E. Bowen	
Plow, W. Donnelly	
Plow, G. Shelton, (reissue)	
Press, baling, H. W. Baumann	
Press for jelly, hand, J. W. Newto Printingpresses, feeder for, F. L.	
Printingpresses, feeder for, F. L. Pump, submerged, Morrell and Br	
Punching metal, machine for, J. C	lark 141,620
Rake, horse hay, J. H. Walker	
Reefing fore and aft sails, L. Nord	en 141,811
Refrigerator, S. M. Fort	
Rein retainer, check, C. H. Perrin.	
Rope clamp, W. H. Downing	
Sash fastener, M. Gee Sash lifter, H.Kingsbury	
Saw guard, circular, O. A. Dean	
Saw mill, circular, E. H. Stearns	141,672
Sawing machine, T. H. Carroll	
Scale, platform, J. Bryson	
Scraper, road, J. Norton	
Separator, grain, W. E. Turner Separators, sieve for grain, E. Dou	
Sewing machine, Hirons and Moon	e 141,791
Sewing machine bobbin winder, T.	
Sewing machine tucker, J. H. Bea	U 141,026
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro	wn 141,626
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treadle for,	wn
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treadle for, Shade holder, T. Moran	wn
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treadle for, Shade holder, T. Moran Shoe uppers, goring, A. J. Goodwin	wn
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treadle for, Shade holder, T. Moran Shoe uppers, goring, A. J. Goodwin Shutter, fireproof, J. B. Cornell	wn
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treadle for, Shade holder, T. Moran Shoe uppers, goring, A. J. Goodwin Shutter, fireproof, J. B. Cornell Sign, J. Harrison Sky lights, pane for, O. F. Saunder	wn. 141,626  J. McEvoy. 141,72; 141,806  141,64; 141,64; 141,78; 141,78; 141,826
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treadle for, Shade holder, T. Moran Shoe uppers, goring, A. J. Goodwin Shutter, fireproof, J. B. Cornell Sign, J. Harrison. Sky lights, pane for, O. F. Saunder, Spike machine, W. A. D. Bowman.	wn 141,626  J. McEvoy 141,72:
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treadle for, Shade holder, T. Moran	wn. 141,626  J. McEvoy 141,722 141,800 1 141,696 141,788 141,828 141,788 141,788 141,788 141,784
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treadle for, Shade holder, T. Moran	wn. 141,624  J. McEvoy 141,722 141,804 1 141,694 141,696 141,758 141,752 141,753 106e 141,658
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treadle for, Shade holder, T. Moran	wn. 141,62¢  J. McEvoy 141,72; 141,80¢ 141,64¢ 141,69¢ 141,75; 141,75; 141,75; 141,75; 160ke 141,63;
Sewing machine tucker, J. H. Bea Sewing machines, F. W. Bro Sewing machines, etc., treadle for, Shade holder, T. Moran	wn. 141,626 J. McEvoy 141,722 141,806 1 141,696 141,728 141,728 141,728 141,738 141,757 161,666 141,637 141,637 141,637 141,637 141,637 141,637
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treadle for, Shade holder, T. Moran	wn. 141,626  J. McEvoy 141,72:
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treadle for, Shade holder, T. Moran	wn. 141,624 J. McEvoy 141,722 141,806 141,806 141,728 141,696 141,736 141,756 141,757 100ke 141,636 141,636 141,827 141,666 141,637 141,666 141,637 141,667 141,637 141,647 141,657 141,657
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treadle for, Shade holder, T. Moran	wn. 141,624 J. McEvoy 141,722 141,806 141,696 141,785 141,826 141,787 141,696 141,757 1608 141,757 1608 141,636 141,636 141,636 141,637 141,666 141,825 141,637 141,647 141,677
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treadle for, Shade holder, T. Moran	wn. 141,624  J. McEvoy 141,722 141,723 141,643 141,643 141,643 141,753 141,753 141,667 141,823 141,823 141,777 141,827 141,777 141,827
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treadle for, Shade holder, T. Moran Shoe uppers, goring, A. J. Goodwin Shutter, fireproof, J. B. Cornell Sign, J. Harrison Sky lights, pane for, O. F. Saunder Spike machine, W. A. D. Bowman. Spinning machine bolster, J. Birke Sprinkler, lawn or garden, H. E. Ce Steam hammer, Quick & Gardner Steel plates, etc., tempering, H. Ur Steering apparatus, J. Myers Stereoscope, L. D. Sibley Stove, base burning, W. Doyle Stove, base burning, S. B. Sexton Stove, heating, L. R. Comstock	wn. 141,624  J. McEvoy 141,722 141,723 141,644 141,694 141,754 141,755 141,822 141,757 141,837
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treadle for, Shade holder, T. Moran	wn 141,624  J. McEvoy 141,722  141,804  141,696  141,755  141,755  141,696  141,755  1606  141,696  141,755  141,696  141,697  141,697  141,697  141,697  141,697  141,823  141,777  141,823  141,777  141,823  141,776  141,825  141,776  141,826  141,776  141,827  141,776  141,827  141,776  141,827  141,776  141,827  141,827
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treadle for, Shade holder, T. Moran	wn. 141,624  J. McEvoy 141,722 141,729 141,624 141,626 141,626 141,735 141,755 141,822 141,837 141,837 141,777
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treadle for, Shade holder, T. Moran	wn. 141,624  J. McEvoy 141,722 141,804 141,644 141,646 141,756 141,757 141,757 141,637 141,647 141,667 141,667 141,777
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treadle for, Shade holder, T. Moran	wn 141,624  J. McEvoy 141,722  141,690  141,800  141,750  141,750  141,750  141,690  141,751  141,752  141,690  141,753  141,690  141,822  141,771  141,822  141,771  141,823  141,771  141,823  141,771  141,823  141,771  141,823  141,771  141,823  141,771  141,823  141,772  141,823  141,772  141,823  141,773  141,823  141,773  141,823  141,773  141,823  141,774  141,823
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treadle for, Shade holder, T. Moran	wn. 141,624  J. McEvoy 141,722  141,624  141,626  141,626  141,752  141,752  141,753  141,822  141,777  141,777  141,777  141,823  141,766  141,823  141,777  141,777  141,777  141,823  141,776  141,837  141,837  141,777  141,777  141,837  141,777  141,777  141,837  141,837  141,777  141,837  141,837  141,837
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treadle for, Shade holder, T. Moran	wn. 141,624  J. McEvoy 141,722 141,624 141,624 141,636 141,735 141,775 141,777 141,777 141,777 141,778 141,837 141,838 141,838 141,838 141,838 141,838 141,838 141,838 141,838 141,777
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treadle for, Shade holder, T. Moran Shoe uppers, goring, A. J. Goodwin Shutter, fireproof, J. B. Cornell Sign, J. Harrison Sky lights, pane for, O. F. Saunder, Spike machine, W. A. D. Bowman. Spinning machine holster, J. Birke Sprinkler, lawn or garden, H. E. Co. Steam hammer, Quick & Gardiner. Steel plates, etc., tempering, H. Ur Steering apparatus, J. Myers Stereoscope, L. D. Sibley Stove, B. Düerstock Stove, base burning, W. Doyle Stove, base burning, S. B. Sexton Stove, base burning, W. Doyle Stove, base burning, J. R. Comstock Stoves, top plate for, J. Van Sugar, etc., purifying, J. M. O. Tan Table, ironing, J. H. Frank Tablet, etc., non-conducting, H. L. Telegraph, chemical, T. A. Edison Telegraph circuit, T. A. Edison	wn 141,624  J. McEvoy 141,722 141,723 141,644 141,694 141,775 141,775 141,777
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treadle for, Shade holder, T. Moran	wn. 141,624  J. McEvoy 141,722 141,723 141,634 141,636 141,755 141,755 141,757 141,777
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treadle for, Shade holder, T. Moran	wn 141,624  J. McEvoy 141,722  141,703  141,604  141,606  141,755  141,755  141,757  141,757  141,821  141,777  141,823  141,777  141,823  141,777  141,823  141,777  141,823  141,777  141,823  141,777  141,823  141,777  141,778  141,778
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machine tucker, F. W. Bro Sewing machines, etc., treatle for, Shade holder, T. Moran	wn 141,624  J. McEvoy 141,722 141,723 141,644 141,646 141,646 141,753 141,753 141,753 141,667 141,667 141,821 141,777 141,777 141,823 141,777 141,823 141,777 141,778 141,778 141,778 141,778 141,778 141,778 141,778 141,778 141,778 141,778 141,778 141,778 141,778
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treatle for, Shade holder, T. Moran	wn 141,624  J. McEvoy 141,722 141,723 141,643 141,643 141,643 141,753 141,753 141,823 141,777 141,778
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treatle for, Shade holder, T. Moran	wn 141,624  J. McEvoy 141,722 141,723 141,643 141,643 141,643 141,753 141,753 141,823 141,777 141,778
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treadle for, Shade holder, T. Moran	wn 141,624  J. McEvoy 141,722  141,629  141,630  141,630  141,753  141,753  141,667  152,141  141,777  141,687
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treatle for, Shade holder, T. Moran	wn 141,624  J. McEvoy 141,725 141,626 141,626 141,626 141,626 141,735 141,735 141,737 141,777
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treadle for, Shade holder, T. Moran	wn 141,624  J. McEvoy 141,725  141,820  141,820  141,755  141,636  141,755  141,637  141,637  141,637  141,637  141,637  141,737
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treatle for, Shade holder, T. Moran	wn 141,624  J. McEvoy 141,723 141,624 141,626 141,636 141,735 141,821 141,755 161,667 161,667 161,677 161,777 161,822 161,777 161,823 171,777 171,823 171,777 171,823 171,777 171,823 171,777 171,823 171,777 171,823 171,777 171,823 171,777
Sewing machine tucker, J. H. Bea Sewing machines, F. W. Bro Sewing machines, etc., treadle for, Shade holder, T. Moran	wn. 141,624  J. McEvoy 141,722 141,624 141,639 141,839 141,75 141,639 141,75 141,631 141,631 141,631 141,631 141,631 141,631 141,77 141
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treadle for, Shade holder, T. Moran	wn 141,624  J. McEvoy 141,722  141,629  141,630  141,630  141,735  141,735  141,630  141,630  141,630  141,631  141,737
Sewing machine tucker, J. H. Bea Sewing machines, F. W. Bro Sewing machines, etc., treadle for, Shade holder, T. Moran	wn 141,624  J. McEvoy 141,722  141,629  141,630  141,820  141,753  161,667  ban 141,837  141,773  141,827  141,773  141,827  141,777  141,827  141,777  141,827  141,777  141,827  141,777  141,827  141,777  141,827  141,777  141,827  141,777  141,827  141,777  141,827  141,777  141,827  141,777  141,838  141,773  141,777  141,777  141,838  141,773
Sewing machine tucker, J. H. Bea Sewing machines, F. W. Bro Sewing machines, etc., treadle for, Shade holder, T. Moran	wn 141,624  J. McEvoy 141,725  141,820  141,821  141,636  141,735  141,636  141,636  141,636  141,637  141,821  141,737  141,821  141,737  141,837  141,837  141,737  141,837  141,737  141,837  141,837  141,737  141,838  Palmer 141,831  141,831  141,831  141,832  141,833  141,833  141,833  141,833  141,833  141,833  141,833  141,833  141,833  141,737  141,737  141,737  141,737  141,737  141,737  141,737  141,737  141,737  141,738  141,738  141,838
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treadle for, Shade holder, T. Moran	wn 141,624  J. McEvoy 141,722  141,629  141,630  141,630  141,631  141,735  161,667  162,632  174,735  174,737
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treatle for, Shade holder, T. Moran	wn 141,624  J. McEvoy 141,723 141,624 141,630 1 141,641 141,630 1 141,735 141,735 141,832 141,777 141,778 141,
Sewing machine tucker, J. H. Bea Sewing machines, F. W. Bro Sewing machines, etc., treadle for, Sewing machines, etc., treadle for, Shade holder, T. Moran	wn. 141,624  J. McEvoy 141,722 141,624 141,630 1. 141,641 141,630 141,735 141,735 141,823 141,777 141,777 141,831 141,777 141,
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treadle for, Shade holder, T. Moran	wn 141,624  J. McEvoy 141,725  141,620  141,630  141,630  141,735  141,635  141,735  141,637  141,637  141,737  141,637  141,631  141,631  141,631  141,631  141,631  141,732  141,631  141,631  141,732  141,631  141,732  141,734  141,737
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treatle for, Shade holder, T. Moran	wn 141,624  J. McEvoy 141,723 141,624 141,626 141,636 141,636 141,735 141,821 141,735 141,637 141,637 141,637 141,737 141,637 141,737 141,737 141,737 141,637 141,737
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treadle for, Shade holder, T. Moran	wn 141,624  J. McEvoy 141,725  141,804  141,604  141,606  141,755  141,755  141,825  141,777  141,635  141,771
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treadle for, Shade holder, T. Moran	wn 141,624  J. McEvoy 141,722  141,630  141,640  141,640  141,650  141,753  161,667  162,670  174,670  174,777
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treadle for, Swing machines, etc., treadle for, Shade holder, T. Moran	wn 141,624  J. McEvoy 141,723  141,624  141,626  141,636  141,735  141,735  141,825  141,777  141,778  141,718  141,719  141,711  141,711  141,711  141,712  141,713  141,713  141,713  141,713  141,713  141,713  141,714  141,715  141,717
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treadle for, Shade holder, T. Moran	wn 141,624  J. McEvoy 141,725  141,804  141,696  141,705  141,705  141,705  141,607  141,607  141,607  141,607  141,607  141,607  141,607  141,607  141,607  141,707  141,807
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treadle for, Shade holder, T. Moran	wn 141,624  J. McEvoy 141,723  141,649  141,649  141,649  141,753  141,753  141,821  141,753  141,821  141,773  141,821  141,773  141,823  141,773  141,823  141,773
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treadle for, Shade holder, T. Moran	wn 141,624  J. McEvoy 141,723  141,649  141,649  141,649  141,753  141,753  141,821  141,753  141,821  141,773  141,821  141,773  141,823  141,773  141,823  141,773
Sewing machine tucker, J. H. Bea Sewing machine tucker, F. W. Bro Sewing machines, etc., treadle for, Shade holder, T. Moran	wn 141,624  J. McEvoy 141,725  141,626  141,630  141,630  141,735  141,635  141,735  141,636  141,832  141,737  141,637  141,631  141,737  141,631  141,631  141,732  141,631  141,732  141,631  141,732  141,732  141,732  141,732  141,737

### APPLICATIONS FOR EXTENSIONS.

Applications have been duly filed, and are now pendingfor the extension of the following Letters Patent ings upon the respective applications are appointed for the days hereinafter mentioned:

26,090.—FOLDING MACHINE.—C. Chambers, Jr. Oct. 29. 26.097.—ELECTRIC TELEGRAPH.—M. G. Farmer. Oct. 29. 26,128.—BILLIARD CUSHION.—G. D. Sharp. Oct. 29. 26,136.—ADVERTISING.—E. WIEBE. Oct. 29. .6,139.—Pump.—W. Wright. Oct. 29.
26,147.—Bundling Wood.—W. L. Williams. Oct. 29. 26,177.—RUBBER BELTING.—D. C. Gately. Nov. 5. 26,178.—RUBBER BELTING.—D. C. Gately. Nov. 5. 26.276.-MAKING RUBBER HOSE.-T. J. MAYALL. NOV.12.

### 26,321.—Casting Mold.—J. P. Broadmeadow. Nov. 12. EXTENSIONS GRANTED.

25.115.—SELF-ACTING WAGON BRAKE.—B. S. Healev. 25,148.—WEIGHING SCALES.—F. M. Strong, T. Ross 25,149.-BLANKS FOR SHOE PEGS.-B. F. Sturtevant. 25,167.—LIGHTING GAS BY ELECTRICITY.—A. Wilson.

### DESIGNS PATENTED.

6,798.—STAMP PADAND RACK.—G.K.Cook, New York city. 9,799.—CAKE HOLDERS.—G. Gill, Taunton, Mass. 6,800.—CLOCK CASE.—J. F. & H. Mann, Brooklyn, N. Y. 6,801.-ADVERTISING DESK .- C. W. Armstrong, Detroit

1,401 & 1,402..-PAPER PATTERNS, ETC.-Domestic Sewing Machine Co., New York city. 1,403.—MEDICINE.—T. S. Fellows et al., Wells, Minn. 1,404.—PAINTS, ETC.—McClosky, Bro. & Co., Phila., Pa. 1,405.—Alpacas, ETC.—McOre & Co., New York city. 1,406.—PAINT.—Prince's Metallic Paint Co., New York city 1,407.—Shoes.—G. A. Reynolds, Utica, N. Y. 1,408.—Hams, etc.—W. J. Rieman & Son, Baltimore, Md. 1,409.—MEDICATED LIQUOR.—M. Vergnole, New Orleans.

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On an application for Design (14y	

# VALUE OF PATENTS,

And How to Obtain Them.

# Practical Hints to Inventors.



ROBABLY no investment of a small sum of money brings a greater return than the expense incurred in obtaining a patent even when the invention is butasmallone. Large inventions are found to pay correspondingly well. The names of Blanchard, Morse, Bigelow, Colt, Ericsson, Howe, McCormick, Hoe and others, who have amassed immense fortunes from their inventions, are well known.
And there are thousands of others who have ealized large sums from their patents.

More than Fifty Thousand inventors have availed

themselves of the services of Munn & Co. during the TWENTY-SIX years they have acted as solicitors and Publishers of the Scientific American. They stand at the head in this class of business; and their large corps of assistants, mostly selected from the ranks of the Patent Office: men capable of rendering the best service to the inventor, from the experience practically obtained while examiners in the Patent Office : enables MUNN & Co. to do everything appertaining to patents BETTER and CHEAPER than any other reliable agency.

HOW TO TO TOTAL This is the closing inquiry in nearly eve

ry letter, describing some invention which comes to this office. A positive answer can only be had by presenting a complete application for a patent to the Commissioner of Patents. An application consists of a Model, Drawings, Petition, Oath, and full Specification. Various official rules and formalities must also be observed. The efforts of the inventor to do all this business himself are generally without success. After great perplexity and delay, he is usually glad to seek the aid of persons experienced in patent business, and have all the work done over again. The best plan is to solicit proper advice at the beginning. If the parties consulted are honorable men, the inventor may safely confide his ideas to them: they will advise whether the improvement is probably patentable, and will give him all the directions needful to protect his rights.

### How Can I Best Secure My Invention?

This is an inquiry which one inventor naturally asks another, who has had some experience in obtaining patents. His answergenerally is as follows, and correct:

Construct a neat model, not over a foot in any dimension—smaller if possible—and send by express, prepaid, addressed to Munn & Co., 37 Park Row, together with a description of its operation and merits. On receipt thereof, they will examine the invention carefully, and advise you as to its patentability, free of charge. Or, if you have not time, or the means at hand, to construct a model, make as good a pen and ink sketch of the improvement as possible and send by mail. An answer as to the prospect of a patent will be received, usually, by return of mail. It is sometimes best to have a search made at the Patent Office; such a measure often saves the cost of an application for a patent.

### Caveats.

Persons desiring to file a caveat can have the papers prepared in the shortest time, by sending a sketch and description of the invention. The Government fee for a caveat is \$10. A pamphlet of advice regarding applications for patents and caveats is furnished gratis, on application by mail. Address MUNN & Co. 37 Park Row,

### Reissues,

A reissue is granted to the original patentee, his heirs, or the assignees of the entire interest, when, by reason of an insufficient or defective specification, the original patent is invalid, provided the error has arisen from inadvertence, accident, or mistake, without any fraudulent or deceptive intention.

A patentee may, at his option, have in his ressue a separate patent for each distinct part of the invention comprehended in his original application by paying the required fee in each case, and complying with the other equirements of the law, as in original applications Address Munn & Co., 37 Park Row, New York, for full particulars.

### Copies of Patents.

Persons desiring any patent issued from 1836 to Novem ber 26.1867, can be supplied with official copies at a reasonablecost, the price depending upon the extent of draw ings and length of specification.

Any patent issued since November 27, 1867, at which time the Patent Office commenced printing the drawing and specifications, may be had by remitting to this of

A copy of the claims of any patent issued since 1836 will be furnished for \$1.