

A substantiating fact is known that a wooden whale-boat has been carried down so deep in the ocean by a harpooned whale that when the whale rose to the surface and was captured, the boat had to be hauled up by the line, and was found to be so thoroughly water-logged and compressed by its few minutes' dive that the wood had become heavier than water. Fishes having live elastic tissue are compressed to the same extent, but recover in rising by their own exertion. It has also been stated that whales that have received a death shot and dived have not come to the surface, although watched for during several days.

(3684) L. N. writes for an effective exterminator for fleas, etc., on domestic animals, and for bed bugs and all other pests of the kind. A little of the essence of pennyroyal sprinkled about is said to be effectual in driving away fleas; Persian insect powder is also used for the same purpose, and we doubt if anything is more efficient than fresh Persian powder of good quality for the destruction of bed bugs and other pests of a similar character. Buhach or pyrethrum (see SUPPLEMENT, Nos. 247 and 299) is highly recommended.

(3685) F. M. S. asks: How many times will I have to carbonize my plater and rods, as described in "Experimental Science," for carbons to use in batteries? A. They will answer very well without recarbonization; but two or three repetitions of the process will improve them.

(3686) W. G. R.—We favor the Staten Island stone, which is a fine grained trap rock. It takes a fine finish.

(3687) W. H. L. asks: 1. Will a dental lamp of one-half candle power, requiring from 3 to 4 volts and 1-20 amperes, work successfully from a medical battery composed of two bichromate cells and an induction coil? And whether it should be attached to the primary or secondary wires? A. Two bichromate cells should easily run a one-half candle lamp. The lamp should be run directly from the batteries, the induction coil being disconnected. 2. What is the E. M. F. and amperage of the Roberts storage battery? A. The E. M. F. of all storage batteries with which we are acquainted is about two volts. As we do not know the constants of the battery referred to, we cannot state the amperage. 3. What is the principle of the governor of the speed in motor of Edison's phonograph? A. The governor of the Edison motor used in the phonograph is a centrifugal governor, which operates by shunting the current through resistance. 4. Can a rheostat of 16 candle power lamps be used successfully with current supplied by an Edison 120 volt incandescent circuit, to do electro-plating? If so, how must the lamps be arranged for silver, gold, copper and nickel plating? A. You may put a lamp in series with your bath. This will give you in the neighborhood of one-half ampere of current. The voltage of the bath terminals will depend on its resistance. For more current put more lamps in parallel, and carry one lead joint to one terminal of the bath, and a single lead from the other terminal to the other main wire. 5. What is the best kind of watch demagnetizer to use with my rheostat? What is the principle of it? And how could I make it? I have a commutator or alternator which is turned by a crank. A. A good way to demagnetize a watch is to attach it to a twisted string and twirl it in front of an electro-magnet, at the same time withdrawing it from the magnet as it rapidly revolves. See query 3275.

(3688) H. R. B. asks: What is the composition used in making rollers for printing presses? I have some pieces of copper tubing of the proper size and wish to make some rollers. How shall I proceed? How long should they be left in the moulds? How shall I get them out? A. Printers' rollers are made by soaking good white glue until it swells to a jelly, drain off all excess of water and mix with an equal portion of glycerine, heat with care so as not to scorch and evaporate the water until the proper consistency is obtained for the required work; which must be done by taking out a small portion, say a tablespoonful, and pour into the bottom of a small tin pan and set the pan in cold water to cool it to the proper temperature. This may require several trials. When the mass becomes of the right temper, pour into the mould, which should be very smooth inside and greased; with the spindle set exactly in the center. Let the mould stand for a day to get thoroughly cold and set, when the roll can be slowly pulled or pushed out by the gudgeon.

(3689) Mrs. Dr. B. asks how to remove iron rust from linen. A. If the ground be white, oxalic acid, employed in the form of a concentrated aqueous solution, will effectually remove fresh iron stains.

(3690) H. L. N. writes: The singeing of hair is at present greatly agitated by the professional tonsorial artist, claiming that through this process the hair will become more vigorous and prevent its falling out. This naturally would be a great benefit for persons with exceedingly thin hair, and especially for those who possess the misfortune of getting bald. Please inform me of your opinion on this subject. A. The remedy appears to be worse than the disease.

(3691) F. M. asks what the influence of a powerful current of electricity would be on the feeling of furs? A. As fur is a non-conductor, we think a powerful current would have no effect on it. Possibly static electricity might be of some service. An experiment would determine this.

(3692) J. L. L. asks: Is there any cement that will fasten stereotype plates to wood bases? I have some plates difficult to nail, as the cut takes all the space. A. We cannot recommend any cement for the purpose. There are cements that would answer for a short time; but the wood is apt to swell and shrink under use, and this, together with the heavy pressure of the press, would be likely to loosen the plate and do injury to the type forms.

(3693) B. T. writes: I found mica float on the surface of the ground scattered for some distance in detached chunks, 10 by 14 inches in width and from 4 to 10 inch in thickness. The float is not transparent, but cloudy, etc. Does the mica lie in veins or deposits like other minerals? Please state what formation is mica found in. How would a person go about to dis-

cover where the float came from? A. No general rule can be given for prospecting for mica. The mineral mica is found in very irregular veins of what is often a coarse granite rock. It occurs in the primitive rocks, such as gneiss and granite. Only general Rules for prospecting can be given. In the Mineral Resources of the United States for 1887, published by the Department of the Interior, Washington, D. C., you will find an interesting and practical article on the subject of mica. We recommend also Anderson's "Prospector's Manual." \$1.50 by mail.

(3694) C. H. M. says: 1. When matter of different specific gravity, but free to move independently in the same mass, is rapidly rotated, what will be relative position taken up by the heavier and lighter parts? Example: Suppose a hollow sphere, partially filled with oil and water in about equal parts, to be rapidly rotated on an axis, will the oil hug the equator and the water be in a ring inside of the oil, or the reverse? Or, what is somewhat equivalent, suppose the earth's rotary motion to be accelerated until all the water on the globe should be thrown out in a ring a thousand miles from the equator, would the earth's atmosphere be outside or inside of the water ring? A. Centrifugal force acts inversely as gravity. The heaviest element goes to the outer side in a centrifugal apparatus. The condition and disposition of the material of the earth would not come under this condition, because gravity must be the greater force, or the material would not hold together, but would fly off into space. Hence the heaviest or densest material would still gravitate to the center. 2. What is the explanation of a substance rubbed against itself producing more friction than if rubbed with equal force against a dissimilar substance? For illustration, two pieces of iron, or of wood, of the same kind, rubbed against each other with a force equal to x , will encounter more friction than if a section of the iron is rubbed with the x force against a piece of the wood. Is there a standard of equivalency established in respect to friction of different substances, bearing against each other in motion? A. In regard to friction of soft or hard substances, so much depends upon lubricants and the smooth and even surfaces that are moving over each other that no general explanation or theory will suit each case. Otherwise, the fact is apparent that soft substances moving upon each other with pressure do not adjust their surfaces of contact to a perfect plane, and are frictionally retarded according to its minute inequalities; whereas, with surfaces of unequal hardness, the tendency of the hardest surface is to assume a perfectly true surface by wear which is found to have the least friction. 3. What is the pitch of ordinary heavy rumbling thunder? How long would a closed organ pipe have to be to produce sound of the pitch of heavy thunder? A. The pitch of ordinary rolling thunder varies considerably, ranging through the median notes of the base clef, and would require a pipe from 8 to 12 feet long. 4. As forces act most readily in the direction of least resistance, does a sound (on account of the atmosphere diminishing in density as we go upward) act more effectively upward than horizontally? A. Sound vibrates more intensely upward than along the surface of the earth. This has been noticed by aeronauts, who hear ordinary sounds from the earth at great heights.

(3695) H. E. F. says: 1. A Corliss engine has just been erected which has a shaft fifteen inches in diameter and eighteen feet in length between bearings. The shaft and wheel weigh ninety-six tons, the former defects $\frac{1}{8}$ of an inch in the middle from excessive weight. With the wheel in motion will this condition change and the shaft resume a straight line? A. The shaft will not assume a straight line, nor approach near to it, unless the speed is so great that a half revolution is equal in time to the natural vibration of the shaft. As the speed of such engines is far below the requirement for synchronal action with the shaft vibration, you will not be able to discover an appreciable amount of relief from the spring of the shaft by its velocity. The shaft is too small. Would like to have more details of the engine. 2. I am running a compound condensing engine which requires four hundred gallons of water per minute. Could that water be passed through a motor or small wheel as it flows into the vacuum and produce a small amount of power? The source of supply is on a level with condenser. Vacuum 27-28 inches. A. A small motor could be run in the condenser water pipe, but it would be of doubtful utility. 3. We could utilize all of the exhaust steam from the engine above referred to in heating water for dyeing purposes. Under these conditions would it pay to run compound non-condensing? Or would it be better economy to use a surface condenser? Water from jet condenser not available for this purpose on account of oil. A. There would be just as much objection to the use of the exhaust for heating the dye tubs as there is to the use of the injection water. You would still have all of the oil in the tubs. 4. At eighty pounds pressure what should be the number of pounds of steam (in weight) consumed in heating sixty cubic feet of water from 50° to 212° Fah.? Also from 150° to 212°? A. It will require 525 pounds of steam to heat the water as stated from 50° to 212° and 207 pounds of steam to heat the amount from 150° to 212°.

(3696) S. R. T. says: Suppose a lead pipe 2 inches in diameter, laid from a spring, descends 19 feet into a ravine, then up 32 feet to the top of a ridge, thence down 70 feet to the base of a building three stories high. Can this pipe be made to siphon the water and raise it to the top of the building, 32 feet high? If so, what is the best way to fill the siphon. By a pump at the spring or an air pump at the house? What is the limit of useful employment of siphons this way? What is a good practical work on this class of subjects, and do you furnish it, and the price? I should have mentioned that the pipe will be a half mile long. A. The pipe can be made to siphon the water to the house, and should flow about 18 gallons per minute at top of house, if free from air. Place the air pump at the house for convenience. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 793, on siphons. The principle of siphonage is perfectly practicable wherever desirable within the limit of atmospheric pressure as applicable to pump suction, say 2½ feet lift, and any height required in an invert siphon. In this way the siphon has been

largely used in the United States for water supply. There are no books on this subject.

(3697) G. D. says: In running an inch pipe about 500 feet from a well upon a hill to supply a house and barn with water, to reach house under about 30 feet water pressure, and to be used for culinary and all house purposes, which kind of pipe is best—lead, ordinary wrought iron gas pipe, or the latter galvanized or tarred? Is the tar coating of the pipe durable? It would seem to avoid the rust of iron pipe, and the possible deleterious effects of the zinc salts from galvanized iron. Would the brass of ordinary globe valves cause salts to be formed, either from the brass or from other metals in contact with it, that would be injurious to health? A. Lead and galvanized iron pipe are the best for conveying water for household purposes. Both are perfectly safe if the water is kept running, or the contents of the pipe entirely drawn off after standing in the pipe overnight. The tarred pipe flavors the water for some time and the tar is not durable upon the inside of the pipe. Brass valves do not affect the water to any perceptible extent. The most approved management for a house and barn supply is to keep a small stream constantly running into a watering trough at the barn, with an overflow to an underground drain.

(3698) M. O. R. says: I am building nearly two miles of fence. Oak pickets $\frac{1}{2} \times 2$ inches 4 feet long, woven in five pairs of wire, Washburn & Moen galvanizing process, in which the zinc is fairly soaked through the iron. Having some doubts as to durability of the oak pickets, I wish to apply some preservative which will not injure the wire, but preserve the wood. Would the Bordeaux mixture (sulphate of copper in a whitewash of lime) do? Is the copper salt injurious, or the lime, or both? Will you suggest something superior? A. There is no objection to the Bordeaux wash. Another way is to use 2 pounds sulphate of zinc and 1 pound salt to 30 pounds dry lime, and color if desired with yellow ochre, or any cheap mineral paint. To give the above a strong body a half pound of glue may be added, dissolved separately. You may also add a little glue to the Bordeaux mixture to advantage. If appearance is no object, coal tar is the best preservative. The whitewashes are not injurious to wood or wire.

(3699) M. C. S. asks: Will it be safe for one who has not had any experience to undertake to make a boiler to run a 2 horse power high pressure engine? What will be the easiest and safest type of a boiler to make? Have you issued any paper, explaining how to construct a small furnace that will be sufficient to melt iron? A. Many amateurs make small boilers and very good ones, but they require some shop privileges. If there is a good pipe fitter in your city, you may with his help make a safe and good boiler for any pressure up 100 pounds or more. You will find illustrations to scale and description of pipe boilers of one to three horse power in SCIENTIFIC AMERICAN SUPPLEMENT, No. 702; you will find a portable furnace for melting 100 to 140 pounds of metal in SCIENTIFIC AMERICAN SUPPLEMENT, No. 180; and for a regular cupola consult West's "Foundry Practice," \$2.50 mailed.

(3700) E. S. asks: What acid or solution can I use to rot or destroy stumps in ground after trees are cut down, mostly oak? How long will it take to rot them? A. There is no quick way of rotting stumps. The cheapest way to get rid of them, if you have no suitable means of pulling, is to bore a $1\frac{1}{2}$ inch auger hole down the center of the stump about 18 inches deep, and put in $1\frac{1}{2}$ ounces of saltpeter, fill the hole with water and plug it tight. In the spring take out the plug, pour into the hole a half pint of crude petroleum oil, and set it on fire. The stump will burn and smoulder to the ends of the roots, leaving nothing but ashes.

(3701) H. W. W. says: How can the phylloxera be destroyed? A. Numberless remedies have been suggested and tried—sulphur, carbon bisulphide, coal tar, lime, soap, caustic soda and many others. The following are among the best receipts: See the SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 167, 205, 464, 471, 478. 1. Try sulpho-carbonate of potassium and sand. 2. London purple, a by-product in the manufacture of rosaniline, mixed with water. 3. Forty-five pounds sodium phosphate, 15 pounds ammonium phosphate, 60 pounds ammonium chloride, 45 pounds potassium sulphate, 75 pounds of soda, 2,800 pounds iron sulphate, 90 pounds flowers of sulphur. Mix with the soil. 4. Mix 45 parts nitrobenzol, 75 parts sulphuric acid, 1,400 parts water. To kill the eggs, make a paste of 4 ounces benzol, 8 pounds lime, and 360 pounds of earth.

(3702) R. J. F.—Window polishing paste is made of 99 parts prepared chalk and five parts each of white bole and Armenian bole, rubbed together into a smooth paste with 50 parts water and 25 parts alcohol. The paste is to be rubbed on the window, allowed to dry, and then rubbed off with cloths.

(3703) H. T. R. asks how to lag pulleys with paper. A. Scratch the face of the pulley with a rough file thoroughly, so that there are no bright or smooth places. Then swab the surface with a solution of nitric acid, 1 part; water, 4 parts; for fifteen minutes; then wash with boiling hot water. Having prepared a pot of the best tough glue that you can get, stir into the glue a half ounce of a strong solution tannic acid, oak bark, or gall nuts, as convenient to obtain, to a quart of thick glue, stir quickly while hot and apply to the paper or pulley as convenient, and draw the paper as tightly as possible to the pulley, overlapping as many folds as may be required. By a little management and moistening of the paper, it will bind very hard on the pulley when dry, and will not come off or get loose until it is worn out. Use strong hardware wrapping paper.

(3704) L. K. asks: What is the best way to prepare the canvas covering on a canoe to be used along the Florida coast? A. For a canvas canoe, rubber cement or varnish is the safest and easiest to apply. Use the kind obtained through the rubber trade and thin it with naphtha. After a painted coat of the thin rubber has dried, the thick paste rubber may be applied all over the outside with a spatula, and if carefully done will make a smooth waterproof boat. Paraffin wax melted in with a hot iron is excellent.

(3705) G. D. asks how to make a thick rubber cement. A. Rubber cement is made by dissolving masticated rubber in benzole or solvent naphtha. We refer you to "Rubber Hand Stamps and the Manipulation of Rubber." \$1.00 by mail.

TO INVENTORS.

An experience of forty years, and the preparation of more than one hundred thousand applications for patents at home and abroad, enable us to understand the laws and practice on both continents, and to possess unequalled facilities for procuring patents everywhere. A synopsis of the patent laws of the United States and all foreign countries may be had on application, and persons contemplating the securing of patents, either at home or abroad, are invited to write to this office for prices, which are low, in accordance with the times and our extensive facilities for conducting the business. Address MUNN & CO., office SCIENTIFIC AMERICAN, 361 Broadway, New York.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

November 24, 1891,

AND EACH BEARING THAT DATE.

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

Agricultural machine, J. E. Reed.....	463,966
Armature core for dynamo-electric machines, E. Thomson.....	463,671
Assay furnace, Ricketts & Bush.....	463,712
Axle, W. H. Curtis.....	463,621
Axle, H. C. Shultz.....	463,797
Axle lubricator, vehicle, J. L. House.....	463,682
Axle, wagon, S. E. Oviatt.....	463,623
Baling press, C. E. Whitman.....	463,620
Baling press, A. Wickey.....	463,673
Banjo, H. C. Middlebrooke.....	463,952
Barber's indicator, C. Van Dusen.....	463,672
Basket, C. E. Gates.....	463,964
Baskets, apparatus for making, B. F. Bobbitt.....	463,714
Batteries, separator for the plates of secondary, C. F. Waldron.....	463,879
Bearing, ball, H. Howard.....	463,833
Bearing box adjuster, automatic, H. L. Hopkins.....	463,627
Bearing, colter and wheel, H. R. Howe.....	463,839
Bed bottom, woven wire, W. B. Noyes.....	463,730
Bed, hanging, W. M. Buell.....	463,657
Bed, wardrobe or folding, F. B. Williams.....	463,655
Bedstead, invalid, W. Coughlin.....	463,944
Beehive, P. H. Ackley.....	463,674
Belt fastener, Hance & Redick.....	463,694
Belt guide and tightener, P. W. Minor.....	463,716
Bicycle, J. H. Mathews.....	463,716
Bicycle, H. B. Murdock.....	463,708
Boiler, See Shooting board.	
Boiler, See Steam boiler.	
Boiler furnace, S. Eggenger.....	463,829
Bolts standard, J. T. Livingston.....	463,903
Boot or shoe, machine for trimming the edge of the upper at the toe of a, G. W. Day.....	463,948
Boots or shoes, crimping machine for, W. E. Frost.....	463,970
Boots or shoes, manufacture of, G. W. Day.....	463,947
Bottle cleaner, E. E. Howland.....	463,853
Box making machine, J. F. Gilliland.....	463,961
Boxes or similar articles, machine for making, plaited, M. Vierengel.....	463,849
Brake, See Car brake.	
Brakes, automatic adjuster for, E. D. Eames.....	463,718
Bridge gate, J. E. Barndt.....	463,677
Bridle, O. Von Briesen.....	463,683
Buckle, harness, W. R. Bruner.....	463,774
Building material, J. O. Rollins.....	463,649
Bullet, patched, L. Marble.....	463,840
Burner, See Gas burner. Hydrocarbon burner.	
Petroleum burner.	
Calcium light apparatus, G. R. Prowse.....	463,870
Calendar, perpetual, D. A. Fisher.....	463,678
Camera, See Enlarging camera.	
Car brake, W. W. Allen.....	463,636
Car brake adjuster, Manchester & Miller.....	463,908
Car brake, railway, M. G. Hubbard, Jr.....	463,627
Car coupling, J. J. McGill.....	463,686
Car coupling, E. S. Meals.....	463,678
Car coupling, A. C. Merritt.....	463,846
Car coupling, G. E. Nichols.....	463,737
Car coupling, W. P. Simpson.....	463,925
Car coupling, J. Van Dell.....	463,782
Car door, grab, D. Miles.....	463,656
Car, dumping, M. O'Connor.....	463,656
Car, dumping, C. D. Page.....	463,659
Car, nursery and lawn, J. A. Elliott.....	463,691
Car wheel chime, F. E. Canda.....	463,940
Card, sample, J. W. Schloss.....	463,657
Card table, F. Vornbrock.....	463,657
Carpet stretcher and tacker, Keogh & Lockman.....	463,716
Carrier, See Hay carrier.	
Carving machine, wood, J. Hunzinger.....	463,636
Case, See Opera glass case. Show case.	
Cash carrying apparatus, H. L. Lovejoy.....	463,894
Cash indicator and recorder, F. Pfeffer.....	463,816
Catamenial sack and supporter, A. Willoughby.....	463,709
Centrifugal separator, C. G. P. De Laval.....	463,794
Chair, See Swinging chair.	
Chalk holder, C. W. Lurtey.....	463,792
Chlorine, making, De Wilde & Reyher.....	463,767
Chromates and chromates, manufacture of, Massignon & Water.....	463,841
Churn, J. H. Brownfield.....	463,800
Churn, J. P. Wilson.....	463,656
Churn power, R. Reese.....	463,872
Cigar lighter, electric, G. N. Engert.....	463,754
Cigar tip former, L. Lichtinger.....	463,653
Cleat, See Rope end cleat.	
Cleaner, See Bottle cleaner. Horse cleaner.	
Clock, electric programme, J. L. McCaskey.....	463,843
Cloth stretching machine, C. A. Cavanagh.....	463,686
Clutch, W. Goldsworthy.....	463,886
Clutch, A. Lesperance.....	463,819
Clutch, Worrall & Lesperance.....	463,824
Clutch, friction, W. Goldsworthy.....	463,894
Coffee pot, B. L. Hutchins.....	463,950
Coffin handle, W. H. Lawson.....	463,885
Coffin lid fastener, J. Richey.....	463,690
Collar for flannel shirts, A. H. Anderson.....	463,884
Commutator for electric machines, W. W. Vail.....	463,801
Compasses, pencil, R. H. Ingersoll.....	463,901
Conductors, machine for covering, C. Klotzbach.....	463,809
Conduit for buildings, surface, R. W. Gibson.....	463,830
Corn cutting machine, H. Wilkins.....	463,930
Corn popping machine, J. C. Futt.....	463,765
Cotton handling device, Williams & Bennett.....	463,708
Coupling, See Car coupling. Thill coupling.	
Cradle, J. K. Potter.....	463,707
Cultivator, S. L. Allen.....	463,610
Cultivator attachment, C. A. Armstrong.....	463,895
Cultivator attachment, E. Children.....	463,841
Cultivator tooth, S. L. Allen.....	463,612
Curling irons, frame for supporting, G. L. Thompson.....	463,999
Curtain and shade stretcher, A. Shampay.....	463,692
Cut-out, multiple fuse, G. K. Wheeler.....	463,704
Cyclists, home trainer for, L. F. Guignard.....	463,812
Dental engine, J. T. Calvert.....	463,855
Diamonds and excessively hard substances, apparatus for drilling, D. D. Palmer.....	463,973
Digger, See Potato digger.	
Door check, A. W. Falne.....	463,813
Door check, G. W. Wright.....	463,821
Door banger, sliding, C. D. Fey.....	463,700
Dovetailing machine, C. E. Parks.....	463,814
Draught equalizer, H. E. Pridmore.....	463,776
Draught equalizer, R. Wickham.....	463,772
Drawing and aerating land and apparatus therefor, system of, W. Reading.....	463,871
Drier, E. Reynolds.....	463,920
Drilling machine, E. E. Claussen.....	463,699
Drilling machine, A. D. Quint.....	463,790
Dust arrester, H. W. Petersen.....	463,689
Dye, blue, A. Herrmann.....	463,898
Dynamometer, carbon brush clamp for, S. Morse.....	463,748
Egg beater, Whitney & Kirby.....	463,818
Electric arc interrupter, E. Thomson.....	463,762
Electric battery, therapeutic, J. A. Crisp.....	463,945
Electric cut-out, E. W. Rice, Jr.....	463,740
Electric lighting system, Hodgson & Stearns, Jr.....	463,783
Electric meter, A. Reckenzau.....	463,822
Electric motor and dynamo, A. L. Parcelle.....	463,704
Electric motor and generator, L. E. Storey.....	463,693
Electric motor mechanism, S. E. Mower.....	463,699
Electric motors, brush holder for, J. E. Lyons.....	463,836

Railway trolley, electric, G. H. Alton.....	463,765
Railways, electric conductor for, C. E. Sargent.....	463,760
Railway wire, insulator and lightning arrester for electric, E. Thomson.....	463,691
Rake. See Hay rake.....	
Ratchet device, M. Reisch.....	463,778
Rolling mill, wire, T. V. Allis.....	463,696
Rolling wire rods and strips, machine for, T. V. Allis.....	463,697
Roofing, metal, W. L. & H. Heberling.....	463,831
Rope end clasp, J. B. Clerget.....	463,807
Rough rounding and channeling machine, H. Briggs.....	463,967, 463,982
Ruching, beaded, G. H. Taylor.....	463,651
Safe, burglar proof, M. Mosier (r).....	463,825
Safe doors, mechanism for closing and opening, W. Corry.....	463,638
Sand driver, J. M. McMaster.....	463,722
Sand screen or filter, C. Monjeau.....	463,759
Sand fastener, E. B. Clark.....	463,735
Saw jointing and setting device, R. N. Mager.....	463,735
Sawmill, band, A. Cunningham (r).....	463,735
Scows, ventilator for lighterage, T. Price.....	463,816
Scraper, dirt, D. F. Oliver.....	463,795
Screen. See Sand screen.....	
Seam machine, automatic, W. W. Hastings.....	463,626
Separator. See Centrifugal separator.....	
Sewing machine motor, F. W. Kremer.....	463,721
Sewing machines, thread unwinding device for, H. A. Bates.....	463,822
Shaft, vehicle, J. A. Scarborough.....	463,723
Ship's hoist disengaging gear, H. J. Simpson.....	463,745
Shoe, F. H. Flagg.....	463,735
Shoe, F. H. Flagg.....	463,734
Shoes, manufacture of turned, D. Bainbridge.....	463,855
Shooting board and plane, Schraubstadter, Jr., & Schilling.....	463,924
Show case, G. E. Allison.....	463,932
Show case or window display stand, J. C. Meisen- bach.....	463,667
Sieve, A. Iske.....	463,801
Signal. See Railway signal.....	
Skate, W. A. James.....	463,955
Skylight, J. Fitzberger.....	463,953
Sole, Jahr & Wedekind.....	463,837
Snap hook, W. C. Bradley.....	463,837
Sole, S. A. Lentz.....	463,971
Sole, S. A. Lentz.....	463,949
Spool finishing machine, J. M. Parker.....	463,847
Spring. See Vehicle spring.....	
Stand, See Wall paper stand.....	
Steam boiler, D. P. McQueen.....	463,804, 463,805
Steam engine, J. T. Lemon.....	463,758
Steam generator, O. H. Taylor.....	463,852
Steam generator for vapor baths, C. Cadv.....	463,939
Stone breaker, R. McCully.....	463,911
Store oil.....	463,913
Stringing instruments, finger board for, H. C. Mid- dlebrooke.....	463,654
Surgical instru ment, electrical, Connable & Har- per.....	463,785
Swing chair, J. B. Johnson.....	463,863
Switch. See Electric subway switch, Railway switch.....	
Table. See Card table.....	
Table leaf support, C. K. Olson.....	463,915
Tack puller, C. H. Slocum.....	463,817
Tank. See Measuring tank, Water tank.....	
Telegraph, C. H. Slocum.....	463,852
Textile materials, apparatus for washing, dyeing, and treating, E. & G. E. Sutcliffe.....	463,846
Thill coupling, G. L. & F. S. Blackman.....	463,618
Thill coupling, J. M. Farmer.....	463,699
Thrashing machine, W. C. Adams.....	463,883
Tickler, C. H. Slocum.....	463,701
Tidy holder, Hornberger & Langens.....	463,877
Tile walls, tie moulding or binder for, C. J. Bogert.....	463,851
Tie weight, J. V. Mitchell.....	463,638
Tones, fire, R. M. Bruce.....	463,887
Tornado placer, S. D. Edgar.....	463,858
Toy bell.....	463,927
Toy, wheeled, C. L. Wiedrich.....	463,783
Tractor for making ice roads and hauling logs, G. T. Glover.....	463,679
Trap. See Mole trap.....	
Trolley wheel, self lubricating, W. Dunne.....	463,723
Trolley wheel, self lubricating, W. Dunne.....	463,723
Truck, car, M. Birdsal & Serrell.....	463,723
Trucks, equalizing bar for, S. Fox.....	463,726
Truss, L. T. Flodin.....	463,717
Tubes, trucking, J. H. Bevington.....	463,617
Tug fastener, H. R. Davis.....	463,775
Tug, hauler, E. A. Baurer.....	463,938
Tyre wheel carriages, release key for, T. C. Josse- lyn.....	463,932
Type writing machine, W. J. Barron.....	463,614, 463,934
Type writing machine, B. A. Brooks.....	463,723, 463,934
Type writing machine, S. A. Dean.....	463,938
Type writing machine, J. Gardner.....	463,859, 463,960
Type writing machine, F. Myers.....	463,910
Valve controlling mechanism for engines, F. R. Skidmore.....	463,845
Valve lubricator, slide, I. J. Leiter.....	463,904
Valves, machine for retitting, C. F. Hall.....	463,787
Vault heater, A. G. Stapel.....	463,926
Vault heater, A. G. Stapel.....	463,926
Vehicle, H. H. Gothe, Drug Company.....	463,686
Vehicle spring, H. R. Raudenbush.....	463,648
Vehicle starter, P. D. Van Vradenburg.....	463,959
Velocipede, L. Boudreau.....	463,825
Veneers, cutting, J. W. Chapman.....	463,968
Veneer drying apparatus, J. Y. Pettetys.....	463,917
Veneer drying apparatus, J. Y. Pettetys.....	463,917
Wall paper or other materials, tool for cutting, A. G. Johnson.....	463,699
Wall paper stand, W. J. Thomas.....	463,658
Washing machine, O. Anderson.....	463,874
Washing machine, R. Newell.....	463,914
Washing machine, R. Newell.....	463,914
Watch maker's lathe, E. S. Stehman.....	463,750, 463,751
Watches, jewel bearing for, W. W. Hastings.....	463,825
Watches, safety pocket for, J. Zwick.....	463,882
Water tank, F. X. Fischer.....	463,791
Water tower attachment, T. Rawson.....	463,749
Weather strip, Blackwood & Goff.....	463,782
Weather strip, Blackwood & Goff.....	463,782
Weigher, automatic grain, C. J. Hartley.....	463,743
Well drilling apparatus, deep, W. Webber.....	463,880
Wheel. See Harvester wheel, Trolley wheel, Water wheel.....	
Wheel, F. P. Circle.....	463,740
Wheel, J. Thiele.....	463,877
Wheelbarrow, A. Hare.....	463,897
Wick, lamp, R. P. Ambler.....	463,961
Windmill gearing, G. M. Allen.....	463,978 to 463,980
Window, show, B. B. Van Derveer.....	463,848
Wire fabrics, machine for weaving coiled, C. Kehr.....	463,933
Wire fabric, machine for weaving coiled, C. Kehr.....	463,933
Wire hanger, C. A. Jacobs.....	

MUNN & CO., Publishers,
SCIENTIFIC AMERICAN OFFICE,
361 BROADWAY, NEW YORK.



COMPTOMETER

Figures any and all kinds of examples. Operated by keys. Saves 60 per cent of time. Increases accuracy, and relieves all mental strain. Why don't you get one?

Send for circular.

FELT & TARRANT MFG. CO.
52-56 Illinois St., Chicago.