

(50) J. E. M. says: Will you please let me know in your next issue, what is the cheapest article that will remove the smell of coal oil from clothing? A. Evaporate the oil by placing the clothing for a sufficient time before an open coal fire. The higher the heat the better, taking care not to inflame the goods.

(51) A. L. J.—A turbine exactly suited to your supply and height of fall is said to give the largest percentage of power.

(52) J. Y. S.—The impinging of feed water upon the flue or tube head subjects it to changes of temperature, and consequently, by local expansion and contraction, disturbs the joint. We recommend the feed pipe placed so as to terminate near the surface of the water, preferably at the side near the center of the tube space.

(53) J. A. R. asks a good plan for refining ordinary "refined solder," or half and half, so that it will make a good smooth wiped joint. Every now and then the metal gets coarse, the joints look rough and sweat. A. The metal gets coarse from the absorption of lead in wiping the joints. Keep the sulphur away, and add more tin until the quality is restored.

(54) W. A. A. asks where magnetic sand can be obtained, and the prices, if it be an article of commerce, also where loadstone can be obtained. A. Magnetic sand is not a commercial article, and probably can only be procured locally. It is found along the St. Lawrence River. Loadstone comes principally from Arkansas and can be purchased of mineral dealers.

(55) P. B. R.—Britannia metal consists of 1 part tin, 2 parts antimony, 1 part bismuth. Your spelter or zinc will not run well in iron moulds. Use moulding sand. Or for iron moulds, mix with tin until the required fluidity is found.

(56) P. C. C.—Raw hide is made into masses sufficiently thick for spindle bearings, by soaking in water until soft, and then moulding with pressure and drying.

(57) H. W. C.—There is nothing but galvanizing that will prevent pump chains and iron pipe imparting the disagreeable taste of iron rust to water. Any painting or bronzing is impracticable.

(58) D. C. B. asks (1) if the production of barytes is now equal or more than the demand. A. The production of crude barytes in 1882 is estimated to have been 20,000 tons, and "the production could be largely increased to meet an augmented demand." 2. Also where it is mainly produced? A. In 1880 according to the census returns:

Connecticut produced.....	6,000
Maine.....	2,200
Missouri.....	4,425
Pennsylvania.....	1,500
Tennessee.....	465
Virginia.....	4,575

3. If in your judgment an increased production of 10,000 tons would find a ready market at nearly the present price? A. We cannot express an opinion on this point. A New Haven firm imported during 1882, 4,000 tons of German barytes. We would recommend you to first canvas the market.

(59) J. E. B.—Fusible alloy melting at 212°, tin 3, lead 5, bismuth 8. Fusible alloy melting at 203°, tin 1, lead 1, bismuth 4.

(60) A. D.—Black crocus is not known in the market. Crocus is a crude kind of rouge and is much darker than rouge. Both are made by calcining copperas or sulphate of iron. The crocus not being so highly oxidized as rouge gives it a sharper cut as a polishing powder.

(61) W. S. P.—The corrosion of water gauge glasses takes place to a slight extent under the most favorable circumstances, but in some parts of the United States the water has an excessively corroding power over what are called the Scotch glasses, which are made of lead or the ash of sea weed and sand. The glass contains much potash, which is quickly attacked by water that is slightly acid, and at the temperature and pressure at which you are steaming your boiler, viz., 90 to 110 pounds pressure, becomes a solvent of silicate of potash. A very small quantity of soda in your feed water, a half ounce to a hogshead or less, will probably neutralize its corroding properties.

(62) W. H. S. asks: 1. What would be correct exposure of a dry plate at 9 A.M., on an object lighted by bright sunlight in December, when the correct exposure at noon would be 10 seconds, all other conditions being the same? A. About one-fourth longer or twelve to thirteen seconds. 2. Would the exposure, under the same conditions, be the same at 3 P.M. as at 9 A.M., and if not what would be the difference? A. Fifteen seconds would be correct, as the light in the afternoon is not as strong as in morning. The noon December sun is as powerful as the June sun at six o'clock P.M. 3. Give length of exposure, same conditions, at noon in June. A. One to two seconds. The time of exposure varies greatly, according to the sensitiveness of the plate, the brilliancy of the lens, and the state of the atmosphere. A thick hazy atmosphere requires more time than one which is clear and crisp.

(63) S. W.—Venus as morning star is sometimes alluded to as the star of Bethlehem. The general opinion among astronomers is that the star of Bethlehem was one of the variable stars that have been seen to expand to great brilliancy for a short time and then disappear. A few such have been seen during the centuries of the Christian Era. The bright morning star now seen is Venus.

(64) T. D. M.—If ball and cartridge are free to move in opposite directions, they will, on exposure of the cartridge, partake of a velocity due to their relative weights for a short distance. If the cartridge is confined so as not to move, the ball will be projected with considerable force, but not in any wise equal to the force as projected from a barrel. Its direction will be very uncertain. We know of no regular manufacturers of gun cotton in the United States. We understand that it was started here, but was not found suitable for general use, and has been superseded by other high explosives, as nitroglycerine, dynamite, etc.

(65) A. C.—Over 50 years ago both Britannia ware and good crockery were made in the United States. It is our opinion that the manufacture of these goods was started during the war of 1812. The composition of Britannia ware has not changed to our knowledge, except for the better, there being now, as of old, several grades or qualities. The first glass made in this country is said to have been at Jamestown, Va., in 1615.

(66) H. F. M.—Rubber goods are vulcanized at a temperature ranging from 250° to 300° Fahr. If you use a steam vulcanizing chamber with direct steam, give 25 to 35 pounds pressure in the vulcanizer, but, in order to insure its proper working, the steam should be much higher in the boiler; and the pressure adjusted in the vulcanizer by a safety valve.

(67) S. T. writes: I wish to use soluble glass as a mineral glue. What can I mix with it to make it more sticky and agglutinative? Which is best for the purpose—silicate of soda, or silicate of potassa? A. Soluble glass is of value as a glue only when it combines with lime, thereby forming an insoluble calcium silicate. The sodium silicate is the cheaper, and therefore more commonly used. The difference in solubility is slight, the potassium silicate being the more soluble. An excellent description of this substance is given in SCIENTIFIC AMERICAN SUPPLEMENT, No. 317.

(68) F. S. W. asks what materials are used, and how are they used, in a Babcock fire extinguisher. A. The principal liquid used is a solution of sodium carbonate; when the extinguisher is brought into active service, a smaller receptacle containing sulphuric acid is opened, so that these two solutions generate carbonic acid gas when they meet.

(69) H. N. writes: Our wards and hall floors (Soldier's Home), Washington, D. C., have been stained with Vandyke brown and waxed; they are five or six years old; near the doors where the tread has been heavy the boards are worn and the stain is worn away, but by continually waxing the wood is so impregnated that I cannot make these places dark again. Is there anything that will go through the wax and sink into the wood and stain the boards again? I have tried Vandyke brown and vinegar put on hot, but it only washes the wax from the surface and will not sink into the wood. A. We would recommend you to wash the locality with turpentine until as much wax as possible has been dissolved away, then apply a mixture of turpentine and asphaltum. This, you will find, will darken the wood work in harmony with that previously stained.

(70) H. S. asks how to ink ribbons for the type writer, and the materials for the colors or dyes. A. An ink for the type writer ribbons can be made as follows:

Aniline black or violet.....	3/4 oz.
Pure alcohol.....	15 "
Concentrated glycerine.....	15 "

Dissolve the aniline in the alcohol and add the glycerine.

(71) S. & E. C. H. asks for recipes for making the so-called "patent rubber composition." A. The following will probably prove satisfactory:

Cooper's best glue.....	8 1/2 lbs.
Extra sirup.....	.2 gals.
Glycerin.....	1 pint.
Venice turpentine.....	.2 oz.

Steep the glue in rain water until pliant and drain it well. Then melt it over a moderate fire, but do not "cook it." This will take 15 to 25 minutes. Next put in the sirup, and boil for three-quarters of an hour, stirring it occasionally and skimming off impurities rising to the surface. Add the glycerine and turpentine a few minutes before removing from the fire, and pour slowly. Slightly reduce or increase the glue as the weather becomes colder or warmer.

(72) C. F. A. asks: (1) How may eight or ten ounce duck be waterproofed and colored a dead grass color, suitable for hunting coats or suits? A. For waterproofing, use a solution of rubber in coal tar benzol, and suspend in this mixture a small quantity of burnt umber (in proportion to produce the desired shade). In applying to the duck stir it up thoroughly. 2. Will chilled shot wear the choke of a Damascus barrel shot gun worse than soft shot? A. No. 3. By what process are chilled shot made? A. The chilled shot are produced by adding a greater amount of tin to the composition with which the shot are coated than is the case with soft shot. 4. How much lighter in weight are chilled than soft shot? A. As far as we are able to ascertain there is not any difference. 5. What is the diameter of 10, 12, and 16 bore guns?

A No. 10 equals.....	3 1/2 of an inch.
No. 12 ".....	3 1/4 " "
No. 16 ".....	3 1/8 " "

(73) W. A. P. writes: 1. Give me a simple receipt for telling oleomargarine from butter? A. There is no very satisfactory test by the use of which butter can be distinguished from the genuine article. Determinations of the melting points of the two articles are sometimes employed. Microscopic examination is frequently resorted to. It is said that fresh genuine butter which has been melted appears under the microscope composed of ovoid granules, and contains no crystals. The artificial product contains crystals. Artificial butter does not melt at once, like genuine butter, to a clear oil, but fuses gradually, a whitish sauce being first formed. 2. Tell me if there is anything you can put in white lead to give it a permanent gloss, as oil soon loses its gloss? Will oil and varnish answer for outside work? A. Old heavy oil is the only thing that can be used to produce the gloss. Varnish is sometimes used, but will not stand.

(74) G. W. R. asks: What size engine and boiler will be required for a boat 15 feet long and 5 feet wide, a paddle wheel boat? Also, how thick the shell of boiler and head should be, and how many pounds of steam it will hold, and what power engine it would be? A. It is a very rare thing to see a paddle wheel boat so small as you name. We think an engine 3 inches diameter of cylinder and 5 or 6 inches stroke would suit. About 2 1/2 horse power. Boiler should have about 30 feet heating surface. After fixing the dimensions of the boiler, apply to the steamboat inspectors for the thickness of iron required.

(75) A. O.—The only device that we can suggest to ignite by a blow is a bit of phosphorus wrapped up in a piece of paper. This, if struck by a hammer, will, under proper conditions, spring into flame. The handling of phosphorus is exceedingly dangerous, so that we hesitate to advise its use. A Doelreiner's lamp, which by the action of dilute sulphuric acid on zinc generates a hydrogen gas, which, if a current be directed on a bit of platinum sponge, produces light, would, we think, be more suitable to your wants.

(76) B. W. S. writes: Several gentlemen and myself have had a dispute on hydraulics relative to the workings of a pump, and have decided to leave the decision to you. These parties claimed to have seen a pump that would work any depth, a hundred feet if necessary, with a cylinder only twenty-five feet from the pump, provided there are valves every twenty feet in the pipe below the cylinder. Now, they admit, according to the teachings of hydraulics, that a pump will not lift theoretically more than thirty-two feet, and practically about twenty-eight, and yet they make that claim and the only explanation they can give is that, as you create a vacuum from one valve to the other, the water from the lower next section will fill that vacuum, and so on down to the last one. A. We have seen the same statement in the papers, but the thing is a fallacy. What is to sustain the column of water, when the valves open? Water can be lifted from no greater depth with, than without these valves; their only effect would be to reduce the shock when the valves close, even if they were made to work by having the supply of sufficient head, or within, say, 20 or 27 feet the height of pump.

(77) A. S. L. asks: 1. What will best cleanse brass chandeliers soiled by flies? A. Oxalic acid and whiting, mixed and applied wet with a brush, and brushed again when dry with a soft plate brush, to polish with dry whiting. 2. What will take the stain from a marble mantel caused by water in which flowers have been standing? A. 2 parts sodium carbonate, 1 of pumice stone, and 1 of finely powdered chalk. Mix into a fine paste with water. Rub this over the marble, and the stains will be removed, then wash with soap and water. 3. What is the best varnish for black straw hats, and how made? A. Best black sealing wax, 1/2 ounce; rectified alcohol, 2 ounces; powder the sealing wax, and put it in with the alcohol into a bottle; digest them in a sand bath or near the fire till the wax is dissolved; lay on warm with a fine soft hair brush before the fire or in the sun. 4. Is the earth attracted by a body however large falling through its atmosphere? A. The attraction between any two bodies is directly proportional to the product of their masses, and inversely proportional to the square of their distances asunder.

(78) H. J. M. H. asks if in the slide valve of an engine the lock nuts on the valve rod want to hold the valve perfectly firm, or should there be some play for the valve between the nuts? What is the best work on engineering? A. They should not, yet should not be rigidly tight. Usually leave the nuts so close to the bearings that there shall be no loose play of the valve lug. See "Roper's Engineer's Handy Book," \$3.50.

(79) A. M. C. writes: We wish to protect our buildings against fire, by building a reservoir on the hillside, and bring the water down in a pipe to hydrants, etc. At what height shall we have to place the reservoir, and what size pipe shall we have to use to throw a stream of water one inch in diameter, fifty feet high? For efficient service the reservoir should be 100 feet above the ground floor of the building, 4 inch service pipe from reservoir to and through buildings with 2 1/2 inch hose and 1/2 inch nozzles, outside hydrants to be well protected from frost, and provided with 2 1/2 hose with 1/2 nozzles.

(80) L. R.—We have never heard of a case of resuscitation from drowning after the individual had been hours under water, but can conceive of possible instances of suspended animation, such as has sometimes led to people being buried alive, and that led to the supposition that one had been dead for hours. The longest quoted instance of immersion and subsequent recovery is twenty minutes, and then it was supposed the immersion had not been complete, as from one to two minutes almost always causes death.

(81) A. G. asks (1) the weight of the heaviest locomotives, including tender, in use? A. A "consolidation" of the Atchison, Pacific and Santa Fe Railroad, weighing 115,000 pounds. 2. Would it require greater or less power to draw a wagon over a plane of glass than over a plane of iron or any substance? A. The hardest and most perfect track has the least friction. Glass is too brittle for a track. Steel is the most perfect track in use.

(82) E. C. N. writes: 1. Given two grinding cylinders or rollers, one seven inches diameter and ten inches face, the other ten inches diameter by seven inches face, the shaft of each running at the same speed, do they each require the same power, and each grind the same quantity in the same time? The above to be used for grinding apples. A. At the same speed of shaft the roller of larger diameter requires the most power and does the most work. 2. How can molasses sirup be converted into good vinegar, or can a better use be made of it? The heat of the past season has soured it just enough to render it unfit for ordinary use. A. Vinegar can be made from the sour molasses by adding water and yeast, and exposure to air by leaving out the bungs.

(83) A. D. asks where he can find something more about vaseline or cosmoline. A. The manufacture of vaseline is quite simple. When the lighter liquids, gases, etc., of the petroleum oil have been distilled over, the remaining product, the tar, is placed in a large open iron boiler, which is suspended over a hot fire in the open air until deodorized, when it is filtered through bone black at such a temperature as to keep it in a liquid state. This is all there is to it. Further details must be acquired from practical experience.

(84) T. F. H. writes: Can you give a recipe for dissolving crude rubber, so as to make a paste or cement such as printers and stationers use in making paper tabs? We are using a preparation made by dissolving rubber in bisulphuret of carbon, but we

find it objectionable on account of the unpleasant odor arising from the carbon, and want to know in what other way a cement can be prepared? A. Rubber is likewise soluble in benzol, in ether, in naphtha, etc. See also answers to query 2, SCIENTIFIC AMERICAN, July 14, 1883. Common glue with about five per cent glycerine is likewise used.

(85) M. I. writes from Texas: This country for miles is covered with a mineral commonly called lignite, it resembles coal very much, but it is very soft and when laid in the air it crumbles up into very small pieces, and when put in the fire it burns, but seems to give very little heat. It is found in places about 3 or 4 feet below the ground, and is only about 12 inches thick, while in other places it is about 3 feet thick. Is the presence of lignite any indication that there is any stone coal deeper in the ground, and, if so, which would be the cheapest plan of probing for it? A. It is presumed that throughout Texas the geological strata containing coal lie beneath the surface, and from the occasional outcroppings that have been found it is inferred that a very extensive deposit of coal lies throughout the State. The superficial presence of lignite does not, however, suggest the existence of coal beneath. Digging and boring are the only methods of determining its existence.

(86) F. T. D.—Gun barrels to be blued are first thoroughly polished, and then packed in charcoal in a cast iron box which is sealed air tight. The case is then heated till just below red heat, and afterwards gradually cooled.

(87) A. B.—We know of no formula for a gravity grade except the limiting one of least traction as approaching a level, and the point of safety in the application of brakes. The practice covers all angles between a dead level for short distances after a descent, and one to twenty for short grades. The steepest gradient known that is worked with brakes for any distance is a branch to the mines near Leadville, which has grades of over 400 feet to the mile. We recommend you to obtain some standard engineering works.

(88) D. Bros.—Supposing that your compound engine is running at 100 revolutions, and that you have an exhaust pressure of about 5 pounds. Each cylinder is developing about 30 horse power, or 60 horse power for the compound engine. The nominal horse power is supposed to designate the size of an engine at some received standard of pressure and speed, while the indicated horse power is variable according to pressure and speed, and may, in your case, be any horse power from 30 to 80. You cannot pulverize bones in a steam digester to any advantage. A mill is universally used.

(89) H. R. C. asks: 1. Is there enough of assaying to make it profitable as a business? A. There are many persons, especially in the West, who use only source of income is from their assaying. 2. What prices are charged? A. The prices vary according to competition and number of assays. The price in New York is generally \$5.00. 3. How long would it require for one conversant with chemical manipulations to learn it, if his whole time were devoted to the study? A. Three to six months. 4. What prices do chemists charge for analyzing substances, such as articles of food, water, etc.? A. From \$10.00 upward according to the number of ingredients to be determined. Write to Professor C. F. Chandler, of New York, for his price list. This will give you specific information on this point.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted January 13, 1885, AND EACH BEARING THAT DATE. [See note at end of list about copies of these patents.]

Alarm. See Low water alarm.	
Alarm lock for tills, Vollrath & McCready.....	310,627
Amalgamating ores, apparatus for, M. P. Boss (r).....	10,549
Anchor, P. Protheroe.....	310,614
Annunciator and spring jack, combined, L. Townsend.....	310,750
Annunciator, speaking tube, R. May.....	310,601
Arm chair and writing desk, C. W. Vogel.....	310,626
Auger, post hole, A. C. Osborn.....	310,608
Axle box and skein, I. & W. Bimel.....	310,778
Axlebox lid, car, T. H. Haberkorn.....	310,820
Axle lubricator, car, S. J. Wallace.....	310,755
Bag. See Mail bag.	
Baluster, J. W. Ferer.....	310,807
Barbed strips, die for making, A. P. Thayer.....	310,622
Battery. See Galvanic battery.	
Bell, bicycle, R. G. Shute.....	310,620
Bicycle, J. L. Yost.....	310,858
Blower for fire grates, S. C. Houghton.....	310,825
Blowers, mechanism for operating fan, Hoffman & Weber.....	310,681
Boiler and straw burning furnace, W. Stephenson.....	310,740
Boilers, machine for calking, H. P. Folsom.....	310,812
Bolt. See Flour bolt.	
Bolt, Buckley & Wineland.....	310,787
Boot and shoe heels, machine for nailing on, L. Cote.....	310,562
Boring doors for locks, guide for, C. F. Nichols.....	310,710
Bosom, detachable, G. W. Lee.....	310,691
Bottle cover, W. H. Redington.....	310,615
Bottle stopper, H. C. Walter.....	310,756
Box. See Axle box. Music box. Paper box.	
Bracelet, Coaling & Atwood.....	310,795
Bracelet clasp, S. Wallach (r).....	10,552
Bracket. See Shingling bracket.	
Bridge truss, E. Thacher.....	310,747
Buckle, H. Howard.....	310,588
Buckle, key, S. M. Adkins.....	310,632
Button attaching machine, R. J. Gilmore.....	310,578
Button setting instrument, E. Kempshall.....	310,830
Cable or electric railway yoke or frame, etc., C. Bullock.....	310,558
Car coupling, D. C. Barton.....	310,563
Car coupling, J. K. Bywater.....	310,788
Car coupling, M. W. McCann.....	310,697
Car coupling, W. V. Perry.....	310,720
Car coupling, J. A. Ross.....	310,726

Car coupling, S. Schroyer.....	310,854	Hitching strap, S. Birdsall.....	310,643	Shoe, W. E. Rose.....	310,725
Car, sleeping, W. W. Fessler.....	310,809	Hoisting apparatus, D. Gilchrist.....	310,667	Shoemaker's work table, A. M. Bollinger.....	310,784
Car starter, C. B. Broadwell.....	310,556	Hoisting bucket, Newell & Laad (r).....	10,551	Shovel step or guard, K. H. Elliott.....	310,567
Car wheel, J. G. Lafontaine.....	310,888	Holder. See Embroidery holder. Lathe tool holder. Sash holder. Ticket holder.		Shrimps, preserving, Yee Fo.....	310,811
Car wheel, Leavitt & Canfield.....	310,597	Hook. See Rein hook.		Shutter worker, J. A. Dyblie.....	310,566
Car wheels, manufacture of, E. B. Meatyard.....	310,701	Horse detacher, T. M. Ferguson.....	310,808	Sifter, flour, W. N. Campbell.....	310,791
Cars, grain door for freight, Mason & Walker, Jr.....	310,600	Hose coupling, S. R. Hackley.....	310,672	Siphon, J. Lay.....	310,863
Carding machine for the manufacture of mottled rovings, Dyson & Cookson.....	310,803	Hose coupling, S. Lightburne, Jr.....	310,834	Spark and cutter arrester, T. H. Haberkorn.....	310,819
Carpets, etc., composition of matter for cleaning, J. J. Hymer.....	310,829	Hub, vehicle, Giles & Link.....	310,576	Spark extinguisher, I. Deyell.....	310,565
Carrier. See Hay carrier.		Hydrant, W. Ryle.....	310,853	Spooler, doubling, L. V. Richmond.....	310,722
Carrying device for melons, etc., hand, J. Old.....	310,607	Hydraulic motor, N. Yagn.....	310,770	Spring. See Velocipede saddle spring.	
Cartridge, H. F. Clark.....	310,650	Incandescents, manufacture of, E. Weston.....	310,761	Spring jack and annunciator, combined, Townsend & Moore.....	310,749
Cartridge for compressed air, W. T. Chamberlain.....	310,643	Indicator. See Movement indicator.		Stair pad, H. W. Mather (r).....	10,550
Cartridge shells, implement for capping and uncapping, G. W. Hadley.....	310,583	Iron, pile for sheet, D. B. Oliver.....	310,711	Steam muffler, C. H. De Witt.....	310,654
Cash carrier elevator, W. S. Lamson.....	310,832	Ironing table and clothes holder, combined, M. Chilcoat.....	310,732	Stopper. See Bell stopper.	
Cash railway switch, W. H. & F. L. Wiggin.....	310,764	Isatins and substituted isatins, manufacture of, P. J. Meyer.....	310,604	Store service apparatus switch, E. L. Giles.....	310,815
Chair. See Arm chair.		Journal bearing, C. E. Barrett.....	310,552	Store service tracks, turn-out for, W. H. & F. L. Wiggin.....	310,765
Channel flap layer, O. Gilmore.....	310,668	Journal box composition, J. H. Hungate.....	310,827	Stove, T. Burkhard.....	310,447
Chopper. See Cotton chopper.		Key. See Watch key.		Stove, Turner & Capewell.....	310,623
Clamp. See Dumb waiter clamp.		Kiln. See Lime kiln.		Stove, heating, S. H. La Rue.....	310,596
Clasp. See Bracelet clasp. Corset clasp.		Knife. See Putty knife.		Strap. See Hitching strap. Shawl strap.	
Collar, horse, Rothham & Schmitt.....	310,818	Knife, J. Nagel.....	310,606	Straps with rings, etc., device for connecting, Parmelee & Swift.....	310,719
Compass, mariner's, Scotland & Corson.....	310,729	Knife grinding machine, Hyde & Vallentine.....	310,861	Stump extractor, H. L. Boyle.....	310,644
Condensing engine, F. A. Gale.....	310,575	Ladder, step, S. A. Gardner.....	310,814	Stump extractor, J. B. Wilson.....	310,767
Conduit pipe, T. Baumeister.....	310,773	Lamp, P. Babcock, Jr.....	310,635	Suspender end, J. B. Sharp.....	310,932
Cooker, steam, H. A. Eaton.....	310,657	Lamp, electric arc, N. McCarty.....	310,837	Switch. See Cash railway switch. Store service apparatus switch.	
Corkscrew, B. Wilhelm.....	310,766	Lamp, electric arc, S. H. Short.....	310,736	Table. See Shoemaker's work table.	
Corset, M. Cohn.....	310,798	Lamp, electric arc, L. G. Woolley.....	310,630	Tag fastener, H. W. Brewster.....	310,785
Corset clasp, J. M. Cohn.....	310,797	Lamp regulator, electric arc, H. R. Boissier.....	310,781	Telegraph, printing, G. M. Hathaway.....	310,587
Cotton chopper and cultivator, G. M. Baeger.....	310,636	Lamp, street, H. G. Schuette.....	310,728	Telegraph, quadruplex, F. W. Jones.....	310,685
Coupling. See Car coupling. Hose coupling.		Lamps, clockwork for mechanical, Cook & Pomeroy.....	310,651	Telegraph, overcoming static disturbances in, F. W. Jones.....	310,684
Crate for fruit, etc., I. B. Seeley.....	310,730	Lamps, cut-out for electric arc, H. R. Boissier.....	310,783	Telephone, H. E. Waite.....	310,751
Crock rims, machine for making, H. E. Merrill.....	310,706	Lanterns and flags, holder for signal, F. W. Coolbaugh.....	310,652	Thrasher spreader, G. W. Gould.....	310,761
Crucible furnace crane, Mallasee & Nimick.....	310,635	Last, shoemaker's iron, Robertson & Tobin.....	310,723	Thrashing machine band cutter and feeder combined, R. Harding.....	310,679
Crusher. See Rock crusher.		Lathe tool holder, J. M. Smith.....	310,739	Ticket holder, W. Patterson.....	310,610
Culinary vessel, T. G. Beaham.....	310,639	Leather skiving machine, G. E. Stockwell.....	310,742	Tire for wheels, elastic, Leigh & McDowell.....	310,862
Cultivator, R. H. Ewing.....	310,806	Leveling rod, R. B. Seymour.....	310,741	Tobacco booking machine, W. Jones.....	310,593
Cultivator, J. Harman.....	310,586	Lime kiln, A. B. Weeks.....	310,759	Tool, combination, T. E. Riedel.....	310,851
Cultivator, J. R. Peirce.....	310,847	Lock. See Alarm lock.		Tooth, artificial, J. A. Priest.....	310,849
Cultivator shovel, adjustable, M. A. Twitchell.....	310,856	Locomotive exhaust nozzle, J. Wotapek.....	310,768, 310,769	Top, spinning, C. H. Fry, Jr.....	310,574
Cultivator, spring hoe, Hench & Dromgold.....	310,821	Low water alarm, H. G. Brooks.....	310,786	Torpedo for danger signals upon railways, T. G. Palmer.....	310,718
Cultivator, sulky, E. F. Husk.....	310,828	Lubricator. See Axle lubricator.		Torpedo railway signal, T. G. Palmer.....	310,717
Curtain fixture, spring balance, W. N. Buckley.....	310,557	Lubricator, S. J. Stevenson.....	310,741	Transplanter, J. B. Johnson.....	310,592
Curtain pole knob, D. B. Olmstead.....	310,712	Mail bag, A. J. Gould.....	310,670	Treadle, C. H. Kingsbury.....	310,636
Curtain roller, window, G. W. Eddy.....	310,658	Measuring and inspecting machine, cloth, C. C. Webber.....	310,757	Tree. See Double tree.	
Cutter head, T. Fitzsimmons.....	310,571	Medical still or vapor generator, L. M. Emery.....	310,588	Tricycle, T. P. & J. B. Hall.....	310,676
Cylinder engine, osc' lating, W. J. Partridge.....	310,609	Mouldings, device for securing, C. Halstrom.....	310,678	Trough. See Feed trough.	
Damper, Manuel & Burrows.....	310,636	Motor. See Hydraulic motor.		Truck and ladder, combined, J. C. Lowen.....	310,836
Damper regulator, T. Evans.....	310,549	Movement indicator, H. T. Field.....	310,860	Trunk, O. R. Meredith et al.....	310,704
Door check, E. Niggli.....	310,844	Music box, J. A. Bradshaw.....	310,645	Tug, hame, Lindsey & Goddard.....	310,693
Door check, A. B. Walker.....	310,752	Musical instruments, head of stringed, A. Hyde.....	310,590	Tuning hammer, F. W. Hale.....	310,673
Double tree, J. T. Dougine.....	310,801	Muzzle, animal, F. M. Moore.....	310,842	Tuning implement, F. W. Hale.....	310,674
Draught equalizer, J. Putnam.....	310,850	Nailing machine, L. Goddu.....	310,816	Unloading and elevating apparatus, M. J. McNelly.....	310,639
Drafting the arm size of garments, apparatus for, G. S. Gates.....	310,666	Neckwear retainer, L. Eschner.....	310,690	Valve gear, J. A. Stout.....	310,743
Drill. See Sear drill.		Necktie, fastening, J. S. Ripley.....	310,617	Vehicle, two-wheeled, J. G. Bocks.....	310,621
Drums or barrel bodies, machinery for drying, G. W. Laraway.....	310,630	Ore furnace, E. F. Russell.....	310,619	Vehicle, two-wheeled, Taliaferro & Mitchell.....	310,746
Drying fabrics, yarn, etc., machine for, J. Jefferson et al.....	310,683	Paint distributor, L. Walkup.....	310,754	Vehicle, two-wheeled, J. Wesely.....	310,760
Dumb-bell for electrical exercising apparatus, electroe, J. H. Shaw.....	310,733	Pan. See Frying pan.		Vehicle wheel, J. H. Bissell.....	310,779
Dumb-waiter clamp, D. D. La Baw.....	310,687	Paper box, L. Lybrand.....	310,599	Vehicle wheel, W. H. Harding.....	310,585
Earthenware vessels, press for forming, Merrill & Dempsey.....	310,705	Paper pulp or stock and obtaining by-products therefrom, treatment of yucca or sotol fiber for the production of, G. B. Walker.....	310,753	Velocipede, W. P. Benham.....	310,776
Eccentric rods, safety guard for, W. H. Diffeffer.....	310,655	Paper tubes, machine for cutting, M. F. Wilson.....	310,629	Velocipede saddle spring, W. Hillman.....	310,823
Electric conductors, underground housing and insulation for, E. C. Townsend.....	310,748	Pavement, terra cotta, J. M. Freeman.....	310,662	Velocipede wheel, A. M. White.....	310,857
Electric currents, system of generating and regulating, E. Weston.....	310,763	Paving, manufacturing asphaltic powder suitable for, H. Kettmann.....	310,594	Vise, bench, W. Mickel.....	310,839
Electric lighting, system of, O. Gasset.....	310,663	Pen holder, J. H. Anderson.....	310,771	Wagon seat, J. T. Dougine.....	310,802
Electric machine, dynamo, H. R. Boissier.....	310,782	Pencil tip and tape measure, combined, I. B. Millner.....	310,840	Wardrobe and chiffonier, folding, H. L. Mehrer.....	310,703
Electric machine, dynamo, E. Weston.....	310,762	Pipe. See Conduit pipe.		Warp slasher, S. R. Campbell.....	310,790
Electric machines, brush holder for dynamo, H. R. Boissier.....	310,780	Pipe and drain tile mould, Earl & Hazard.....	310,859	Washing machine, F. McKimmy.....	310,638
Electricity, apparatus for distributing, O. Gasset.....	310,664	Pipe wrench, J. F. Guthrie.....	310,818	Watch key, H. G. Skidmore.....	310,737
Electricity, apparatus for the distribution of, O. Gasset.....	310,665	Pipes, protector for underground, W. & J. M. Rowbottom.....	310,727	Watch stem winding and setting attachment, H. A. T. Reincke.....	310,865
Elevator. See Cash carrier elevator. Hay elevator.		Pitman rod, D. Michaels.....	310,707	Water repellent fabrics, preparation of a fluid for making, A. B. Conger.....	310,560
Elevator guide posts, chair for, C. G. Otis.....	310,713	Plow beam and attachment, J. Logan.....	310,634	Wheel. See Car wheel. Propeller wheel. Vehicle wheel. Velocipede wheel.	
Embroidery holder, J. B. West (r).....	10,538	Plow, gang, J. W. Bartlett.....	310,775	Wheels, manufacture of, Owen & Dyson.....	310,846
Engine. See Condensing engine. Cylinder engine.		Plow, hilling, R. Schuster.....	310,855	Window guard, J. Polkowski.....	310,721
Engines, regenerator for compound, T. Hulme.....	310,826	Post. See Fence post.		Wire, machine for making compound, J. W. Ellis.....	310,805
Extractor. See Stump extractor.		Projectile, line throwing, P. B. Roys.....	310,852	Wire, machine for screw threading, L. Goddu.....	310,817
Feed trough, J. Blattner.....	310,554	Projectile, pneumatic, W. T. Chamberlain.....	310,649	Wrench. See Pipe wrench.	
Feed water heater, T. Evans.....	310,570	Propeller wheel, N. Cain.....	310,789	Zincography, J. W. Barron.....	310,638
Fence, W. H. Brevoort.....	310,555	Pulley lubricator, loose, F. Gleason.....	310,669		
Fence, D. Camp.....	310,559	Pulp, machine for the reduction of wood, E. P. Ely.....	310,659		
Fence, T. P. Van Loven.....	310,624	Pump, force, G. W. Coonse.....	310,561		
Fence post, A. D. Doubleday.....	310,800	Punching and shearing machines, double throat for, C. E. McBeth.....	310,602		
Fence wire fastener, E. S. Lenox et al.....	310,833	Putty knife, C. Ives.....	310,682		
Fence wires, device for measuring the strain on, A. Overbigh.....	310,845	Radiator, steam, Arci & Chapman.....	310,633, 310,634		
Fences, making barbed, F. D. Ford.....	310,813	Radiator, steam, W. H. Page.....	310,714, 310,715		
File, paper, F. D. Weber.....	310,758	Railway, E. B. Meatyard.....	310,702		
Firearm, breech-loading, E. L. Lake.....	310,639	Railway frog, T. B. Jewett.....	310,591		
Fire escape, T. P. Hall.....	310,675	Railway frog crossing, C. B. Price.....	310,613		
Fire escape, L. B. McDonald.....	310,603	Railway rail joint, chair, and splice, W. F. Gould.....	310,581		
Flour bolt, J. F. Ayres.....	310,772	Railway rail, street, T. L. Beaman.....	310,640		
Flour bolt, J. O. Frazier.....	310,572	Railway tie or support, J. K. Clark.....	310,794		
Forging bolt blanks, machine for, Bruderer & Burdick.....	310,646	Reflector, E. D. Peck.....	310,611		
Forging machine, nut, F. A. Hasenclever.....	310,650	Regulator. See Damper regulator.			
Frying pan, Mason & Winsor.....	310,864	Rein hook, D. Hutchinson.....	310,589		
Furnace. See Gas furnace. Glass furnace. Ore furnace.		Ring traveler machine, R. J. Gilmore.....	310,577		
Furnace, G. Gulickson.....	310,582	Rock crusher, A. G. & J. M. Dyer.....	310,656		
Furnace front, W. Lowe.....	310,835	Rock drill valve, G. R. Cullingworth.....	310,653		
Galvanic battery, W. K. Kieder.....	310,831	Rocket, E. F. Linton.....	310,598		
Gas and other machines, cooling attachment for, J. Ring.....	310,616	Roller. See Curtain roller. Shade roller.			
Gas conducting mains, preventing leakage from, H. Moeser.....	310,841	Roofing, etc., composition for gravel or granite, T. Vaughan.....	310,625		
Gas furnace, W. Swindell.....	310,745	Roofing machine, sheet metal, J. L. Holton.....	310,824		
Gas governor, automatic, M. O. Gorman.....	310,580	Rotary engine, F. C. Morton.....	310,843		
Gas retort, A. C. Swain.....	310,744	Sash and door sticker, J. H. Glover.....	310,579		
Gas valve, automatic, I. B. Millner.....	310,605	Sash holder and weather strip, combined, A. J. Davis.....	310,564		
Gear cutting machine, Coes & Miller.....	310,796	Saw filing machine, H. Sherman.....	310,735		
Gearing, friction, G. M. Wheeler.....	310,867	Saw frame rod, C. Tenney.....	310,806		
Glass furnace, J. V. Ebel.....	310,804	Sawmill set works, D. C. Prescott.....	310,848		
Glove fastener, W. S. Frost.....	310,573	Saw swaging machine, B. H. Miller.....	310,708		
Governor, ball, R. McKenna.....	310,838	Sawing machine, scroll, A. S. Davis.....	310,543		
Grain, reducing, A. C. Nagel et al.....	310,709	Screw tap, H. W. Bill.....	310,777		
Grain separator and cleaner, E. Sherman.....	310,734	Secondary battery and transporting the same, L. H. Rogers.....	310,724		
Grinding or polishing surfaces, wheel for, J. E. Compton.....	310,799	Sea bridle, W. W. Averell.....	310,551		
Guano distributor, S. H. Bell.....	310,642	Seed drill, J. Hamilton.....	310,584		
Guard. See Window guard.		Seed, removing fiber from cotton, W. Wall.....	310,628		
Handle for pot and other covers, G. E. Palmer.....	310,716	Separator. See Grain separator.			
Harrow, G. F. Clark.....	310,793	Sewing machine, J. W. Post.....	310,612		
Hay carrier, T. C. McNichols.....	310,700	Sewing machine binding attachment, R. Hilgner.....	310,822		
Hay elevator, P. F. Fleming.....	310,810	Sewing machine for stitching buttonholes, eyelet holes, etc., Hallenbeck & Phelps.....	310,677		
Heater. See Feed water heater.		Sextant, P. Leuba.....	310,632		
Hinges, hood for shutter, C. W. Barnekow.....	310,637	Shade roller, spring, J. C. Lake.....	310,595		

**Advertisements.**

Inside Page, each insertion - - - 75 cents a line.  
 Back Page, each insertion - - - \$1.00 a line.  
 (About eight words to a line.)

Engravings may be ordered at the same rate per line, by measurement, as the letter press. Advertisements must be received at publication office as early as Thursday morning to appear in next issue.

**GET THE BEST AND CHEAPEST.**

**J. A. FAY & CO.**  
 GINGINNATI D.  
 SUII ABITS IIAFO STATES.  
 (Cincinnati, Ohio, U. S. A.)

Exclusive Agents and Importers for the United States, of the

**CELEBRATED PERIN BAND SAW BLADES,**  
 Warranted superior to all others in quality, finish, uniformity of temper, and great durability. One Perin saw outwears three ordinary saws.

It will pay you to read the following:— We offer (for a limited period) a SPECIAL BARGAIN.

**A \$15 GUN FOR 60 DAYS FOR \$12 ONLY.**

The American Arms Company's Semi-Hammerless Gun is the finest single breach loader in the world; there is no other Single Gun made that will compare with it. EVERY MODERN IMPROVEMENT, finest Stub Twist barrel, CHECKED BORE, and warranted to shoot close; Imported Checkered Pistol Grip Stock, Automatic Shell Extractor, Removable Lock Patent Fore-end, dead nickel frame, Double Bolt, TORPEDO ACTION, 12-gauge, 28 or 30-inch barrel, weight, 7 to 7 1/2 lbs. Pushing down the lever on the side cocks the gun, the hammer being inside, thus combining the safety of a hammer action with the handiness of a hammerless gun. The manufacturer's price is \$15 for this gun; we offer it for 60 days, from January 24, 1885, for \$12, boxed free, and when cash comes with order, will give free, a complete set of Reloading Tools. This gun uses either brass or paper, 12-gauge, centre-fire shells. Read the following from the manufacturers:

To whom it may concern: We guarantee that the "Semi-Hammerless" single guns advertised by J. A. Ross & Co., are our Uniform Standard Quality. (Signed) AMERICAN ARMS CO., P. O. Box 110, New York, N. Y. No one wanting a good gun can afford to let this opportunity slip, as we go to the length of not selling this gun, after 60 days, for less than our regular catalogue price. We have sold hundreds of these guns at \$15 and \$14, since September, 1883, giving universal satisfaction, and we guarantee to take back gun and refund money, if the gun is not exactly as represented. J. A. ROSS & CO., 16 and 17 Beekman Square, Boston, Mass. *Do not mention this paper.*

**WATCHMAN'S IMPROVED TIME DETECTOR,**  
 WITH SAFETY LOCK ATTACHMENT.

Patented 1875, 1876, 1877, 1880, 1881, 1882. This instrument is supplied with 13 keys. Invaluable for all concerns employing watchmen. It contains all modern improvements, and is far superior to the old style. 1882—At the National Exposition for Railway Appliances at Chicago. The only Medal for the most complete and Perfect Instrument. P. O. Box 2875. Send for circulars to E. IMHAUSEN, 212 Broadway, New York.

**APPARATUS FOR ELECTRICAL MEASUREMENTS.**—Illustrations and description of the various interesting apparatus for measuring electricity that were shown at the Munich Exhibition, including Wiedemann's bifilar galvanometer; Wiedemann's galvanometer for strong currents; Zenger's differential photometer; Von Beetz's solenoid; apparatus for demonstrating the principle of the Gramme machine; Van Rysselberghe's thermometrograph; Von Beetz's chronograph; and Mariacher's apparatus for studying deep currents. Illustrated with seventeen engravings. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 421. Price 10 cents. To be had at this office and from all news-dealers.

**#3 Printing Press Do Your Own Printing!**  
 Card & Label Press \$3. Larger sizes \$5 to \$75. For old or young, 250,000 impressions, printing in all directions, send 2 stamps for Catalogue of Presses, Type, Cards, etc. to the factory. KELSEY & CO., Meriden, Conn.

**ICE-BOATS — THEIR CONSTRUCTION and management.** With working drawings, details and directions in full. Four engravings, showing mode of construction. Views of the two fastest ice-sailing boats used on the Hudson river in winter. By H. A. Husk, M. E. Contained in SCIENTIFIC AMERICAN SUPPLEMENT, 1. The same number also contains the rules and regulations for the formation of ice-boat clubs, the sailing and management of ice-boats. Price 10 cents.

**PATENTS NEGOTIATED ABROAD.**  
 THE AMERICAN AND FOREIGN INDUSTRIAL ASSOCIATION of New York undertakes the sale of Patents in Europe. Is connected with the "Joint Stock Association" of London and has Agents in Paris, Brussels and Berlin. For further particulars, address HENRY A. HERBERT, President, 135 Temple Court, New York.

**PERFECT NEWSPAPER FILE**  
 The Koch Patent File for preserving newspapers, magazines, and pamphlets has been recently improved and price reduced. Subscribers to the SCIENTIFIC AMERICAN and SCIENTIFIC AMERICAN SUPPLEMENT can be supplied for the low price of \$1.50 by mail, or \$1.25 at the office of this paper. Heavy board sides; inscription "SCIENTIFIC AMERICAN" in gilt. Necessary for every one who wishes to preserve the paper. Address **MUNN & CO.,** Publishers SCIENTIFIC AMERICAN.

**STEPHENS' VISES**  
 Fifty per cent of Time and Labor saved by using this Solid Strong, Durable, Quickest Working, Finest Holding Vise. Has the Improved Paper Pipe and other Attachments. Sold by the Trade. Send for Circular to MELVIN STEPHENS, Prop., Office, 41 Jay St., New York.

A Printed copy of the specifications and drawing of any patent in the foregoing list, also of any patent issued since 1866, will be furnished from this office for 25 cents. In ordering please state the number and date of the patent desired, and remit to Munn & Co., 361 Broadway, New York. We also furnish copies of patents granted prior to 1866; but at increased cost, as the specifications, not being printed, must be copied by hand.

Canadian Patents may now be obtained by the inventors for any of the inventions named in the foregoing list, at a cost of \$40 each. For full instructions address Munn & Co., 361 Broadway, New York. Other foreign patents may also be obtained.