(35) W. O. says: My engine appeared to blow through when running light, or with little or no work on. The valves and piston work smoothly, and appear to be steam-tight. The question arises: What is the cause of this blowing through? The indicator diagrams exhibit an unusual amount of back pressure or compression; and although I did not have an opportunity of taking a diagram when running light, it is reasonable to suppose that the compression is the same as when in full work. The compression, which begins at half stroke, is equal to the initial pressure of steam at the end of stroke, the steam being cut off sharply. The forward pressure gradually runs down until, during the latter half of stroke, there is a point where the back pressure overbalances the forward pressure (namely, the pressure above the main valve, or between piston and cut-off valve), which forces the main valve up and allows the steam to escape during the latter half of stroke, the engine being carried over by the momentum of the fly wheel. It is necessary to state that the steam is regulated by a variable cut-off governor, which relieves the main valve of undue pressure. Am I correct? A. Your explanation seems plausible according to the diagrams, but we do not get a very clear idea of the arrangement of the valves. If the valve lifts on account of too much cushion, change it. The first thing to determine, however, is whether or not the valves are tight; as it is only when this matter is settled that the engineer can properly begin to theorize about the indicator diagram.

(36) R. M. says: I have been round Cape Horn and the Cape of Good Hope several times, and I have been round the globe twice in a sailing ship, but it is slow travel. I propose to make my next voyage around the globe in 24 hours. By going up in the air high enough to clear the current that follows the globe round, remaining there 12 hours, I will let the earth do the traveling; then I will descend, land the mails in China, take in the United States mail, ascend for 12 hours more, then come down and land the China mail in New York. I believe this can be done and will be done yet. A. We do not understand what you mean by the current of air that goes round with the earth, unless it is the atmosphere; in which case, we do not think that you will get out of it.

(37) I. L. T. says: I read that, after a house was struck by lightning, a tin cup had a tendency to adhere to the kettle spout, and finally the spout would suspend the whole weight of the tin cup. Upon further investigation, it was found that any nail in the house would suspend a common darning needle. Can you explain it? A. If the statement is reliable, the fact that every particle of iron about the premises was found to be temporarily polarized is a fine illustration of the power of the induced currents liable to be generated on the instant of the passage of the discharge.

(38) W. M. W. asks: How can I prepare heavy cotton cloth to prevent the evaporation of alcohol? I want to cover over open barrels, and would like some preparation that will be pliable. A, Melt paraffin with 5 percent of linseed oil, and run into cakes for use. When needed, melt, and spread the mixture over the cloth with a brush.

(39) F. W. D. says: I attempted to make the phosphorized oil light (described in a back number of the SCIENTIFIC AMERICAN) by placing a piece of phosphorus of the size of a hazel nut in a four ounce phial, filling one third full of boiling hot olive oil; but it and would not operate. Was the phial too large? What kind of phosphorus should I use? A. Use a larger proportion of phosphorus. The phosphorus should be that known as clear. The red variety will not answer the purpose.

(40) H. C. W. says. In the SCIENTIFIC AMERICAN of October 24 you state that a gallon of water will produce a gallon of steam if confined in the same space. I think you have made a mistake, as I do not think that it would produce steam at all, but would remain water. A Have you any authority for your opinion? 2. Please give me a rule for finding the sizes of the pulley in the head of the lathe, to fit a fly wheel, so that the belt will be tight on each of them? A. See p. 93, vol. 22.

(41) P. H. asks: Is there any method of hardening steel so that it will drill a file or hardened steel? A. Heat the steel to cherry red and quench it in mercury.

(42) R. R. asks: 1. What is the best way to mend an overshoe that is all rubber? How can I mend one that is rubber and cloth? How can I mend a leather shoe without sewing a patch on, using cement prepared for the purpose? A. A solution of pure gum rubber in naphtha will answer these purposes. 2 Can the gum of an old overshoe be dissolved in any way to make it useful as a cement? A. Owing to the large amount of sulphur in such rubber, we do not think it would pay you to try the experiment.

I once saw a fire lighter of the shape and size of an egg, with a wire fastened in it, to be dipped in coal oil to kindle fires; can you tell me how to make it? A. Ordinary potter's clay is mixed with sulphur or other inflammable substance, molded into the desired form and thoroughly burned. It will then be found to be exceedingly porous and will then absorb, by capillary attraction, a large quantity of oil.

Is there any kind of preparation that will make any kind of goods waterproof without injuring the goods? How is it prepared and used? A. Ten pounds of alum and a similar quantity of acetate of lead are dissolved in sufficient warm water, and the mixture allowed to stand till the precipitate of sulphate of lead has settled down. The clear solution, acetate of alumina, is poured off, and mixed with water in which dissolved isinglass is stirred up. The articles to be made waterproof are steeped in this mixture for twelve hours, after which they are dried and subjected to pressure. This process will render the cloth both water proof and moth proof.

(43) J. V. R. asks: What is carbolate of iodine composed of? A. This is not a chemical compound, known as such to chemists.

(44) J. H. M. says: 1. In looking over the back numbers of the SCIENTIFIC AMERICAN, I find a question by W. B. N. about the rack and pinion and eccentric set works for sawing lumber. There appears to me the greatest difference imaginable between the systems. In the first place, the rack and pinion block has a uniform motion throughout the whole of its movement; the first and last 1-32 of an inch is made at precisely the same speed as any of the intermediate parts of an inch, provided there is a uniform speed of the lever. Therefore, in order to set correctly and not throw a small log too far away from the knee, you are compelled to stop the lever very gradually, and at an exact point. If not, your lumber will be too thick or too thin, which is not the case with the eccentric head blocks. While the lever is being moved at a uniform speed, the motion imparted to the knee by the double eccentrics is an accelerated and a retarded motion, until the knee actually stops while the lever is still in motion, so that it is not necessary that the lever should be moved to any fixed point in order to make even lumber. With the eccentric block you have only to go through with a certain manipulation to get certain and accurate thicknesses. The manipulation need not be accurate, but the lever may vary two inches in one movement as compared with another. Another advantage is that, while the lever is moving either backwards or forwards, the knee always moves ahead. Therefore you can set as quick as you can with the rack and pinion, for you have only to go through with the same process. A. There are various devices for operating the rack and pinion set works, also for operating the eccentric set works. By a sudden or quick jerk on the lever, either device is liable to throw a light log too far away from the knee unless it is fastened to it. There are several effective devices for accomplishing the latter. The only liability, then, is to the extent of slack which may exist in the working parts. 2. In our mill, we have a cog wheel and pinion to drive 5 gangs and 2 large circular saws. This gear is driven by two 18x40 inch cylinders. The cog wheel is 10 feet diameter with 7 arms, depth of rim 5 inches, width of rim 16 inches, size of mortice for cogs 1¾x12 inches, diameter of hub for shaft 16 inches, length of hub 12 inches. The cogs of said wheel are made of maple, well fitted and driven hard and fastened with dovetailed keys. The rim of this wheel has been broken; and in order to mend it we took two wrought iron rings, 1½ inches square, and put them on hot, to shrink the rim together. Would there be contraction enough to the shaft wheel to prevent our taking out the shaft? A. A shrinking of the bands on the blank cog wheel would undoubtedly diminish the size of the center hole, proportionately to the extent of pressure and size of wheel, causing it to grip the shaft.

(45) M. M. asks: In what months do the winds blow the strongest, and what are the prevalent directions? A. In February and March. From S. W., W. by S., and N. W.

(46) B. says: Some zinc castings are to be exposed to the weather; but as they are of an ornamental character, I want to wash them with some chemical that will oxidize them to some extent and give them a better color. I have tried ammonia, but find that the rain will run down on the castings in a milky stream, giving them a streaked appearance. Can you tell me what will oxidize the castings with a color that will stand exposure, or, in other words, what will hasten natural oxidation? A. Your best plan would probably be to try a series of experiments on the subject, by using the various acids beginning with nitric, and making them of various degrees of strength and different temperatures until the object in view is accomplished.

(47) R. C. asks: Is there any instrument to test the sourness of vinegar, so as to tell when it is fit for market? Is there any instrument to test the sweetness of cider, to tell if it will turn into vinegar quickly? A. The means employed require more apparatus and care than could be employed by one who is not a chemist.

(48) C. F. O. says: I have some very nice books which have been handled by careless persons. How can I clean off the finger marks and dirty spots? A. We do not know of any other method than the use of rubber.

(49) C. H. asks: What will clean hammered granite after it becomes dark or dingy? A. Try careful washing with a moderately strong acid.

(50) W. D. asks: How can I color paraffin yellow, red, blue, black, etc., so that it will retain the coloring when in a melted state? A. Except with black, we believe this has not yet been accomplished. By continued experiment you might possibly discover the true method.

(51) Z. C. B. asks: Is there a composition with which the insides of vinegar tanks, made of spruce lumber, can be painted to make them tight, which the vinegar will not affect? A. Pitch is used for this purpose.

(52) C. H. M. asks: Why are the brilliant jewels, that so much resemble diamonds, called paste? A. The ingredients (white sand, pearlash, niter, arsenic, manganese, etc.) are first made into a paste with red lead, which, after the mass has been fused, imparts to the glass beautiful prismatic colors.

Upon what does the magnetic tension of a helix depend, upon the number of turns of the wire, or upon the volume of electricity flowing through it? Which would induce the more magnetism, a helix of small wire composed of 400 spirals with 3 cups to excite it, or a larger wire of 200 spirals and 6 equally strong cups to produce the current? A. It depends upon the number of farads per second, and the compactness of the helix, for the inductive influence is inversely as the square of the distance from the core. As to electricity and crystalization see p. 187, vol. 31.

(53) G. H. H. asks: 1. Is there any test besides experience by which we may know that a room on the ground floor should not be used as a sleeping apartment, on account of dampness? A. The hygrometer is used for this purpose. 2, In ventilating a room, should the flue open near to the ceiling or near to the floor? A. Near the floor in many instances, but no general rule can be given. 3. Is the lightest air necessarily the impure air? A. No.

(54) O. B. says: From philosophical works, I find that gold as a conductor of heat is set down at 1 000, silver 972, tin 303, firebrick 11. Earthenware is composed of a substance that ranks it as a conductor with firebrick. From the above figures then, it appears that silver is more than 88 times a better conductor than firebrick or earthenware; yet Professor Tyndall in his work on "Heat as a Mode of Motion," in speaking of the comparative radiation of a silver teapot and an earthenware one, both being filled with boiling water, says: "The silver produces but little effect, while the radiation from the earthenware is so copious as to drive the needle to 80°." Why is it, too, that in practice tin is always preferred for hot air pipes to flues that are smoothly plastered? Of course, some advantage would be derived from the superior smoothness of the tin; the ascending air currents would not encounter so much friction, but this advantage would not compensate for the difference in the conducting capacity of the two substances, tin being more than 27 times a better conductor than the plaster. Please explain. A. Good radiators are good absorbers of heat, that is, the surfaces which can easily communicate motion to the ether are equally capable of accepting it from the ether. On the contrary, a bad radiator, such as a metallic surface, is a bad absorber, and therefore a good reflector. Hence, the thinnest metallic film upon a surface powerfully protects it from the action of radiant heat.

(55) L. O. asks: What is a test for lard oil? A. The operation of determining the quality of the oil is one of considerable difficulty, and cannot be advantageously employed by one who is unacquainted with chemical operations.

(56) M. A. asks: Why do the leaves of one tree turn yellow and fall, while the rest are still bright and green? A. It is probably due to some accident that has befallen the tree, which has caused the premature change in the color of its foliage.

(57) W. A. C. asks: How can I make a good burnishing ink for the heels of boots and shoes? A. Take soft water 1 gallon, extract of logwood 1 oz; boil them until the extract is dissolved, then remove from the fire and add copperas 2 ozs., bichromate of potassa and gum arabic, each ½ oz., all to be pulverized. This makes a cheap and good color for shoe or harness edge; but for cobbling and for new work, upon which you do not wish to use the hot kit, but finish with heel ball you will find that if, as you pour this out into the bottle to use, you put a tablespoonful of lampblack to each pint of it, it will make a blacker and nicer finish. It makes a good color for cheap work, but for fine work, nothing will supersede the following: Alcohol 1 pint, extract of logwood and tincture of iron each 1 oz., nut galls, pulverized, 1 oz., sweet oil ½ oz mix.

Will insects preserved in a solution of arsenic have any injurious effects if kept in a sleeping room? A. We think not. Arsenic is not a volatile poison.

Where can I obtain a *Nautical Almanac*? A. Of any dealer in nautical instruments.

Can you furnish back numbers of your paper? A. Generally. Send us a list of what you require.

How can I make a cheap telescope? A. See p. 186, vol. 30.

(58) M. K. asks: Do you recommend coal tar as the best preservative for the bottom of red cypress fence posts in the ground? A. Tar dipping is very good; solutions of chloride of zinc and of corrosive sublimate are also extensively used for this purpose. Another good method is that of slightly charring the ends of the posts, as charcoal is very unchangeable, resisting perfectly the action of both air and moisture. Timber and grains of wheat and rye, converted into charcoal 1,800 years ago, at Herculaneum, remain as entire as if they had been charred but yesterday.

(59) C. says: I have a glass 55 inches long with 2⅜ inch objective. It is a ship glass, with a power of only fifty times. You state that a glass with that sized objective may be made to magnify a hundred and fifty if it is to be used for an astronomical glass, which I often want to do. Can I have a stronger eyepiece, that I can use for such purposes? A. Yes.

What metal in common use would answer for a faucet for vinegar, and would not be affected by it? A. Block tin might be used, but faucets of wood are by far the best for this purpose.

What is the best to use on a boat to prevent its water-soaking? A. Try coal tar.

(60) S. J. L. says: I learn that Professor Bischoff, of Glasgow, filters water for drinking purposes through spongy iron and powdered limestone. The iron is procured in a powdery, spongy state by the reduction of an ore without fusion after the extraction of sulphur and copper by heat. Can you give me such information as will enable me to do this? A. Iron may be obtained in a finely divided state as the hydrated sesquioxide, by using nitric acid as the solvent and precipitating it with ammonia, decanting the supernatant liquid, and washing the precipitate several times with water.

(61) W. H. F. asks: What is best for filling such woods as walnut, butternut, oak, etc., previous to varnishing, and how is it applied? A. Boiled linseed oil and carbonate of lead is used for this purpose.

Can toy balloons be made by blowing the rubber into bubbles? A. No.

Wood expands with water, but a cord which is of woody fiber shrinks. How is this? A. Wood does not expand longitudinally, but transversely. This swelling, as in the case of the cord, causes it to twist very tightly, which accounts for the longitudinal contraction.

How can I gild or bronze the inside of a cocoa-nut shell that I have made into a bowl? A. First apply two or three coatings of boiled linseed oil and carbonate of lead. When quite dry, lay on a thin coat of gold size. This is prepared by grinding together some red oxide of lead with the thickest drying oil that can be procured, mixed, previous to using, with a little oil of turpentine, till it is brought to a proper consistence. When the size has sufficiently dried, the gold leaf is applied upon the point of a fine brush, and gently pressed down with a ball of soft cotton. The dextrous application of a camel's hair brush sweeps away the loose particles of the gold leaf without disturbing the rest.

(62) I. C. C. asks: I am making a hollow glass prism for liquids. Bisulphide of carbon smells too badly to suit me. I am informed that oil of cassia has a still higher dispersive power. Is this true? A. Yes. 2. What cement or varnish can I use, that is not permeable to or soluble in that liquid? A. Take a quantity of common shellac, dissolve in alcohol, expel the solvent by evaporation, and melt. Apply hot.

(63) G. asks: 1. Does the nickel plating process without the use of a battery, devised by Professor Stolba, give as substantial a covering as the one with a battery? A. It gives a fine covering, which is quite durable. 2. Does the Stolba process deposit any of the zinc used in the solution? A. No.

How are chloride of nickel and sulphate of nickel made? A. Chloride of nickel is formed by dissolving the oxide in hydrochloric acid. Its solution on evaporation yields green hydrated crystals. Sulphate of nickel is obtained by dissolving metallic nickel, or its oxide or carbonate, in sulphuric acid. It crystalizes in green, rhombic prisms, which require 3 parts of cold water for solution.

(64) J. P. asks: How can iron stains be eradicated without damage to the fabric? A. Wet the spot with lemon juice, sprinkle with salt, and lay to the sun to dry. Repeat the application until the stains are removed.

(65) J. T. V. asks: Can you inform me of a process for making sensitive paper? A. See p. 314, vol. 30.

What chemical is used for preparing the automatic telegraph receiving paper? A. If a current be made to pass through paper soaked in iodide of potassium, iodine will be separated at the positive wire, and a brown stain will be produced. It is more convenient to employ a mixture of equal parts of saturated solutions of ferrocyanide of potassium and nitrate of ammonia, diluted with an equal volume of water, one part of each solution to two parts of water. Any kind of fine, white, unglazed paper will answer the purpose.

(66) Q. asks: How is the crystalized or frosted appearance on galvanized sheet and cast iron produced? A. Immerse for a short time in dilute nitric acid.

(67) E. E. P. asks: What is the best sizing to apply to outside brickwork before painting? A. Try boiled linseed oil and carbonate of lead.

(68) J. D. asks: Is there any liquid substance as subject to capillary attraction as water, and not so easily evaporated? A. We know of no such liquid.

What would be the result if an irresistible came in contact with an immovable? A. The supposition is absurd, for there can be neither except as mere metaphysical conceptions.

(69) M. B. asks: 1. Where should a tree one hundred feet high break, in order that the part broken off may reach from the top of the stump to a point on the ground fifty feet from the root of the tree? A. At 37 feet 6 inches from the ground. 2. Will you please give me a rule by which all such examples can be worked? A. See Euclid, Book I, Prop. 47. "The square of the hypothenuse of a right-angled triangle is equal to the squares of the sides which contain the right angle."

(70) A. C. Jr. writes to correct statements made in our answer to A. F. C., on p. 135, current volume, in regard to the Leclanché battery, which were founded on misconceptions of its real action. In the Leclanché, the conditions of ordinary batteries are not changed. In this, as in all other forms of battery where it is used, zinc is the electro-positive element, or one acted upon. The electro-motive force of a Grove being 100, this is 75 and Daniells' 50; or 3 cells of this battery are equal to 4 of the Daniells. It cannot be driven to do more than a limited amount of work (running down in a very short time if kept on closed circuit), and therefore continues its usefulness for a very long time.

(71) H. C. W. says, in reply to W. F. S., who asked as to the action of oils on rubber: Some time ago I put some kerosene oil in a bottle, closed it with a rubber stopper, and laid it down on its side, so that the oil came in contact with the rubber. In a day or two, I found the oil had swelled the rubber to about twice its original size, and forced it out of the bottle, spilling the oil. On drying the stopper, it took its original size and shape.

(72) H. P. says, on producing musical tones from thin goblets: I hear that it is now very difficult to find glasses which will produce a clear musical tone. Fine glass of old manufacture is lead glass, and has a beautifully brilliant appearance; and when struck, it gives a very clear note. If the edge is thin, it is very easily thrown into musical vibration. But very little of this glass is now made; a year ago there were but two manufactories of it in this country, and one of those gave it up during the past year. The manufacture of lime glass has been so very much improved within a few years that it is taking the place of the more expensive lead glass, and it is sometimes difficult, even for an expert, to tell by the eye which is which but when the glasses are struck, there is longer any doubt. The lead glass gives a pure clear tone, in comparison with which the sound from the lime glass is weak and harsh; and no amount of rubbing will bring a note from the edge of the lime glass.

(73) J. H. G. says, in reply to H. H. M., who asks: "What will harden coal tar so that the heat of the sun will not cause it to run or melt?" I have an old fashioned steep shingle roof that I had covered with English roofing felt; then I had coal tar applied (about five feet square at a time) and then I sprinkled clean coarse bar sand on the tar. So far it has made a good, cheap roofing, which does not run. The roof is quite a steep one, and the tar was applied last August.

(74) J. K. says, in answer to C. M. C.'s question as to thumping in an engine: I think the center of piston and the center of crank pin are not in a straight line, and that the crosshead is too loose.

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

G. F. F.—It is an impure quartzose rock, colored by sesquioxide of iron.—A mineral sample with a trace or address contained galena.—E.—It is a quartzose pebble, with a seam coated with oxide of iron.—I. B. P. L.—Both specimens are chiefly microscopic crystals of magnetite, together with crystalized fragments of zircon and quartz.

P. B. asks: How can I get rid of rats, otherwise than by poison or traps?—M. A. H. & B. ask: 1 Will an 18 inch burrstone mill grind corn into good meal? The mill is an under runner, hung stiff on the spindle, with a dress quite deep at the eye but shallow at the skirt; speed from 400 to 600 revolutions per minute. Some old millers say that such small stones have to be set so close that the meal will heat, and the speed is so high that the grain will be thrown out before the grinding has been completed. They also declare that such a mill will take more power than an upper runner of 48 inches diameter. Is this so? 2. We have 8 horse water power; how much corn ought this to grind per hour?—B. G. B. asks: Of what material is the reed of the euphonic whistle, sometimes called the prairie whistle, made?—W. W. B. asks: What is the mode of operation for isochronizing the hair or balance spring of a watch?—A. F. W. asks: How shall I make a good article of candy, of various flavors?—T. S. M. & Co. ask: How is manganese converted into manganite?—J. McD. asks: What is the best method of drying corn and corn meal on a small scale, so that the meal may be shipped without danger of heating? Is it better to dry the corn or to dry the meal?—W. H. R. asks: How can I make muriatic salts of nickel?

COMMUNICATIONS RECEIVED.

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

On a Sliding Face Plate. By E. B. W.

On a Siphon Ram. By B. F.

On the Sun and the Earth. By W. L.

On Copper in Mineral Springs. By J.N.P

On Scientific Truths. By A. M.

On the Squares of Numbers. By E.B.W

On Lacing Belts. By C. McC.

Also enquiries and answers from the following:

K. L.—I. D. I. S.—C. W. C.—C. S. B.—G. W. B.—E.L.—J. S. J.—H. I. M.—J. K. P. W.—C. E. S.—L. S. H.—J. C. K.

HINTS TO CORRESPONDENTS.

Correspondents whose inquiries fail to appear should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them. The address of the writer should always be given.

Enquiries relating to patents, or to the patentability of inventions, assignments, etc. will not be published here. All such questions, when initials only are given, are thrown into the waste basket, as it would fill half of our paper to print them all; but we generally take pleasure in answering briefly by mail if the writer's address is given.

Hundreds of enquiries analogous to the following are sent: "Where can a machine for making matches be obtained? Who sells a basket sifter? Who makes combined butter printers and scales? Whose are the best books on mechanical drawing? Who sells dies for cutting envelopes? Who makes a machine for dressing millstones? Where can lathes for turning butter ladles be bought? Who sells battery carbons? Where can a paper bag machine be bought? Whose is the best hammer hay press? Where can a computing machine be obtained? Who sells egg testers? Who makes pocket alarm watches? Where can information about the uses and selling prices of mica be found? Who sells flint glass for lenses? Whose is the best steam plow? What is the price of a terrestrial globe, 2 feet in diameter? How can the sugar-refining business be learned? Who sells corn mill apparatus, to do the best work with the least power?" All such personal enquiries are printed, as will be observed, in the column of "Business and Personal," which is specially set apart for that purpose, subject to the charge mentioned at the head of that column. Almost any desired information can in this way be expeditiously obtained.

[OFFICIAL.]

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October 27, 1874,

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Fire extinguisher, H. S. Parmelee	156,374
Fork, horse hay, J. F. Troxel	156,241
Forms, turning globular, A. J. Kane	156,293
Frame for children, safety, J. Perkins	156,307
Furnace, metallurgical, N. W. Wheeler	156,244
Furnace, hot air, W. H. Lotz	156,362
Furnace, steam-generating, G. W. Cummings	156,208
Furnace, regenerator, A. Ponsard (r)	6,107
Game apparatus, W. A. Elderkin	156,212
Gas purifying, Hulett & Chandler	156,351
Gas, regulating cock for, E. F. Brooks	156,330
Grain binder, J. McNeal	156,301
Grain drill cleaner, J. H. Bean	156,202
Hame fastener, S. Miller	156,368
Hammer, power, J. C. Butterfield	156,276
Harvester, J. Hall	156,344
Harvester binder attachment, C. M. Suter	156,390
Heater, soldering iron, Burwell *et al.*	156,332
Heater, evaporating, A. M. Rodgers	156,258
Heel-grinding machine, Thompson & French (r)	6,109
Hinge, gate, Shepard & Adams	156,315
Hinge, lock, A. J. Alston	156,325
Hinge, lock, C. B. Clark	156,277
Horse collar stay, W. H. Penfield	156,306
Horse hoof protector, J. H. Guest	156,342
Hydrant, J. A. Stacy	156 385
Ink or fluid, writing, I. M. Reams	156,379
Iron and steel, making, A. T. Hay	156,220
Ivory, fictitious, J. W. & I. S. Hyatt	156,354
Kiln, R. F. Marshall	156,364
Knitting machine, H. Pease	156 376
Knitting burrs, oiling, J. Maxwell (r)	6,106
Latch, gate, E. Halsey	156,345
Letter box, J. H. Williams	156,246
Lock, A. Hermann	156,349
Loom shuttle, J. Dornan	156,337
Loom shuttle guide, Hastings & Gerald	156,347
Mechanical movement, F. H. Richards	156,236
Milking stool, N. E. Hinds	156,222
Mills, toll taker for grist, J. F. Stratton	156,317
Mining machine, coal, R. Fletcher	156,339
Negative softener, W. W. Whiddit	156,245
Nozzle, J. H. McConnell	156,300
Nut locks, D. R. Pratt	156,234, 156,235
Offal, apparatus for treating, T. Webber	156,321
Ores, reducing, N. W. Wheeler	156,243
Overalls, A. Rosenberg	156,381
Paper box, S. M. Clark	156,333
Paper-cutting machine, T. S. Greenman	156,217
Paper-cutting machine, D. Heston	156,286
Paper pulp stock grinder, F. A. Cushman	156,335
Photographic paper, T. Doney	156,210
Piano action, upright, C. Petitclerc	156,308
Pianoforte attachment, A. Steinway	156,388
Pile cutter, G. H. Cavanagh	156,204
Pills, etc., machine, T. J. Young	156,398
Planter, corn, J. A. McClure	156,367
Plow, Buckley & Harms	156,331
Plow, P. H. Decker	156,283
Plow, H. B. Whittemore	156,396
Plow, corn, A. F. Batcheller	156,268
Plow shade attachment, J. G. Darby	156,282
Pocket book, D. N. B. Coffin, Jr.	156,206
Press, cotton, G. W. Stewart	156,387
Propeller, screw, N. A. Patterson	156,375
Pump, M. S. Clark	156,279
Punch, Morgan & Reid	156,231
Purifier, flour and middlings, C. F. Keller	156,294
Purifier, middlings, J. B. Martin	156,299
Railroad time signal, J. Hughes	156,289
Rake, horse hay, S. H. Bushnell	156,275
Refrigerator, J. J. Bate	156,269
Roof, fireproof, J. D. Pierce	156,309
Rope socket, F. Bowen	156,271
Rowing exercise apparatus, L. D. Tice	156,392
Sash fastener, T. L. Shaw	156,314
Saw handle, W. Millspaugh	156,369
Scales for weighting coins, W. Schmolz	156,259
Sewing machines, etc., driving, W. B. Snow	156,383
Sewing implement, combined, F. L. Waterman	156,261
Sewing machine cutter, T. L. Barber	156,367
Shirt, H. B. Fanton	156,214
Shoe, club foot, W. Autenrieth	156,200
Shoe lace, metallic spring, S. Haight	156,218
Shoe pac, moccasin, Kelleher & Randlett (r)	6,099
Sinks, etc., cleaning, R. A. McCauley	156,366
Smoke stacks, cone for, S. Hughes	156,288
Soldering machine, Hine & Bentley	156,223
Soldering machine, D. Guptail	156,343
Spindle step, Chatterton & Mayor	156,205
Spinning wheel, M. McLeod	156,230
Spirits, rectifying, C. B. Jarvis	156,253
Sportsmen, decoy bird for, Strater & Sonier	156,239
Stereoscope, A. Quirolo	156,311
Still, oil, Alexander & Eberhard	156,265
Still, oil, McGowan & Van Syckel	156 229
Stone-dressing machine, T. J. Gifford	156,215
Stone-splitting machine, S. S. Brooks	156,374
Stove, cooking, G. W. Swett (r)	6,102
Stove, cooking, N. S. Vedder (r)	6,104
Stove cover, J. V. Vrooman (r)	6,108
Table, L. Postawka	156,310
Table, game, W. C. Stiles	156,389
Table, book-supporting, Patterson & Swenson	156,304
Tack, stair carpet, M. Krickl	156 353
Telegraph cable, G. Zanni	156,399
Tellurian, G. P. Tindall	156,319
Thermostat, electrical, W. B. Watkins	156,242
Thill holder, F. C. Burchell	156,248
Thistle extractor, Blimer & Eckel	156,203
Tile, etc., porous, S. E. Loring	156,361
Tobacco, suspending, S. R. Mathewson	156,254
Tobacco, treating, M. R. Pearsall	156,305
Toilet case, chamber, E. Ewing	156,213
Toy pistol match, W. S. Beecher	156,323
Transplanter, G. E. Coppen	156,280
Tube expander, O. Pagan	156,373
Turning globular forms, A. J. Kane	156,293
Type, line curver for, T. H. Winchester	156,247
Umbrella, cane, A. Hill	156,221
Valve, discharge brake, G. Westinghouse, Jr.	156,322
Valve, safety, E. H. Ripley	156,312
Vault, safe, etc., A. L. Stimson	156,261
Vehicle wheel, G. Cornwall	156,281
Vessels, fender for, D. R. Pratt	156,233
Vise jaw, movable, B. F. Stephens	156,386
Wagon seat, S. G. Peabody	156,377
Washing machine, J. A. Eno	156,338
Watch key, F. Jacot	156 356
Watch regulator cap, W. H. B. Schmied	156,313
Watch balance cock die, Manchester & Bolen	156,227
Watchmaker's wheel stretcher, R. Cowles	156,207
Water wheel, R. Hunt	156,224
Wheel for harvesters, etc., S. S. Stultz	156,240
Windlass, W. H. Harfield (r)	6,105
Windmill, Sholes & Kelly	156,316
Windmill, E. and D. C. Stover (r)	6,101
Window blind, etc., A. A. Jaqua	156,400
Wooden handles, making, T. Piper	156,378
Wrench, B. G. Martin	156,365
Wrench, W. R. Moore	156,370

APPLICATIONS FOR EXTENSION.

Applications have been duly filed and are now pending for the extension of the following Letters Patent. Hearings upon the respective applications are appointed for the days hereinafter mentioned:

31,220.—FINGER GUARD.—M. L. Ballard. Jan. 13.
31,252.—IRON BALE TIE.—J. J. McComb. Jan. 13.
31,284.—FINGER GUARD.—M. L. Ballard. Jan. 13.
31,315.—GRINDING CARD TEETH.—C. Hardy. Jan. 20.
31,578.—PAPER FOLDER.—W. H. Milliken *et al.* Feb. 10.

EXTENSIONS GRANTED.

30,536.—FINISHING GAS FITTINGS.—J. W. Lyon.

DISCLAIMER.

30,536.—FINISHING GAS FITTINGS.—J. W. Lyon.

DESIGNS PATENTED.

7,806.—ENVELOPE RACK.—M. Bennett Jr., Hartford, Ct.
7 807.—VASE.—J. R. King, St. Paul, Minn.
7,808.—SPOON HANDLE.—C. Osborne, N. Attleboro', Mass.
7,809 and 7,810.—OILCLOTH.—C. T. Meyer *et al.*, Bergen, N. J.
7,811.—OILCLOTH.—J. Meyer, Lansingburgh, N. Y.
7,812.—SIDEBOARDS.—L. E. Steinman, Cincinnati, O.
7,813.—BOTTLE.—J. H. Williams, Broadalbin, N. Y.

TRADE MARKS REGISTERED.

2,037.—BINDER.—J. R. Barrett & Co., Chicago, Ill.
2,038.—CIGARS, ETC.—Batchelor Bros., Philadelphia, Pa.
2,039.—MEDICINE.—E. Edmundson, Jr., Pittsburgh, Pa.
2,040.—NAILS, ETC.—Wallace & Sons, New York city.
2,041 and 2,042.—TAR CORDIALS.—H. R. Wishart, Phila., Pa.
2,043.—CARBON BLACK.—The C. B. Co., New York city.
2,044.—PUBLICATIONS.—J. Gruber, Hagerstown, Md.
2,045.—MEDICINES.—J. C. Street & Co., New York city.

SCHEDULE OF PATENT FEES.

On each Caveat.....$10
On each Trade Mark.....$25
On filing each application for a Patent (17 years).....$15
On issuing each original Patent.....$20
On appeal to Examiners-in-Chief.....$10
On appeal to Commissioner of Patents.....$20
On application for Reissue.....$30
On application for Extension of Patent.....$50
On granting the Extension.....$50
On filing a Disclaimer.....$10
On an application for Design (3½ years).....$10
On application for Design (7 years).....$15
On application for Design (14 years).....$30

CANADIAN PATENTS.

LIST OF PATENTS GRANTED IN CANADA, OCTOBER 29 to NOVEMBER 7, 1874.

3,999.—N. Stephens, Brooklyn, Kings county, N. Y., U. S. Improvement in cement lined pipes, called "Stephens' Improved Cement Lined Pipe." Oct. 29, 1874.

4000.—M. S. Schario, Village of Sunderland, Ontario county, Ont. Improvement in spring bed bottoms, called "Schario's Improved Spring Bed Bottom." Oct. 29, 1974.

4,001.—I. Fréchette and Louis Coté, St. Hyacinthe City, P. Q. Une machine à faire les cambrures de bottes et souliers, called "Le Tailleur de Cambrures de Fréchette." (Boot and Shoe Crimping Machine." Oc- 29, 1874.

4,002.—J. O. Brown, Forestville, Chatauqua county, N. Y., U. S., assignee of O. M. Sweet, same place. Improvement in step ladders, called "Brown & Sweet's Improved Step Ladder." Nov. 2, 1874.

4,003.—M. J. Althouse, Wanpun, Fond du Lac county, Wis., U. S., assignee of G. Raymond, same place. Improvements on wind wheels, called "Althouse & Raymond's Wind Wheel." Nov. 2, 1874.

4,004.—D. Morse, Chicago, Cook county, Ill., U. S. Improvements in churn dashers, called "Moore's Improved Churn Dasher." Nov. 2, 1874.

4,005.—J. Head, Andover, Alleghany county, N. Y., U. S. Improvements on a machine for scouring leather, called "J. Head's Leather-Scouring Machine." Nov. 2, 1874.

4,006.—A. F. Cooper, Cambridge, Middlesex county Mass., U. S. Improvement on medicated pads or belts for the cure of rheumatism and other kindred complaints, called "Dr. Cooper's Medicated Pad or Belt." Nov. 2, 1874.

4,007.—N. H. Dolsen, Chatham, Kent county, Ont. Improvements on car couplings, called "Dolsen's Automatic Car Coupling." Nov. 2, 1874.

4,008.—O. P. Flynt, Boston, Suffolk county, Mass., U. S. Improvements on ladies' garments, called "Flynt's Dust and Weather Protector." Nov. 2, 1874.

4,009.—L. D. Adams, Buffalo, Erie county, N. Y., U. S. Improvements in car couplings, called "Adams' Car Coupling." Nov. 2, 1874.

4,010.—H. Servis, Rochester, Monroe county, N. Y., U. S. assignee of C. M. Coolidge, same place. Improvements on a process for producing caricature photographs, called "Coolidge's Process for Producing Caricature Photographic Pictures." Nov. 2, 1874.

4,011.—A. Goth and C. A. Wolle, Bethlehem, Northampton county, Pa., U. S. Improvement on machines for coating paper with oil colors, called "Goth & Wolle's Machine for Coating Paper with Oil Colors." Oct. 7, 1874.

4,012.—J. Authors and W. F. Munro, Toronto, Canada. Useful form for the head or the slot in the head of screw nails, called "Author's Improved Screw." Nov. 7, 1874.

4,013.—A. D. Cable, Montreal, Can., and O. B. Howard, Portland, Cumberland county, Me., U. S. Improvement on racks and safes, called "Cable & Howard's Rack and Safe." Nov. 7, 1874.

4,014.—F. S. Barnjum, Montreal, P. Q. Improvements on pantaloon stretchers, called "Barnjum's Patent Pantaloon Stretcher." Nov. 7, 1874.

4,015.—C. A. Hussey, New York city, U. S. Improvements on railroad axle boxes, called "Hussey's Railroad Axle Box." Nov. 7, 1874.

4,016.—G. Woods, Cambridgeport, Middlesex county, Mass., U. S. Improvements in processes for drying lumber, called "Wood's Process for Drying Lumber, etc." Nov. 7, 1874.

4,017.—K. McKenzie, Hamilton City, U. S. Improvements on cooking stoves, called "McKenzie's Revolving Oven Cook Stove." Nov. 7, 1874.

4,018.—L. B. Stilson, Minneapolis, Hennepin county, Minn., U. S. Improvements on safety car shoes, called "Stilson's Safety Car Shoe." Nov. 7, 1875.

4,019.—K. McKenzie, Hamilton city, Ont. Improvements on sheet pattern cutting blocks, called "McKenzie's Sheet Pattern Cutter." Nov. 7, 1874.

4,020.—C. Rommel, Elizabeth, Union county, N. J., U. S. Improvements on polychromatic printing machines, called "Rommel's Universal Polychromatic Printing Machine." Nov. 7, 1874.

4,021.—J. Ney, Jr., Ellice Township, Perth county, Ont., and A. Eby, Dowine Township, Perth county, Ont. Machine for the catching and collecting of the Colorado potato bug, called "The Colorado Bug Catcher." Nov. 7, 1874.

4,022.—T. E. Roberts, Ionia, Ionia county, Mich., U. S. Improvement on spark arresters and consumers, called "Roberts' Spark Arrester." Nov. 7, 1874.

4,023.—J. Tomlinson, Goderich, Huron county, Mich., U. S. Improvements in barrels, called "Tomlinson's Improved Barrel." Nov. 7, 1874.

4,024.—G. L. Anders, Boston, Mass., U. S. Improvements on printing telegraphs, called "Anders' Improved Printing Telegraph Instrument." Nov. 7, 1874.

4,025.—E. C. Tozer, Newcastle, Northumberland county, New Brunswick. Improvements on freezing and refrigerating apparatus, called "Tozer's Freezer and Refrigerator." Nov. 7, 1874.