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## Notes &amp; Queries

J. N. W. will find directions for brown-iron gun barrels on p. 11, vol. 32.—L. M. F. H. and A. L. B. will find a description of an artificial ice process on p. 54, vol. 31.—W. M. B. should test his engine with an indicator.—E. A. K. and H. T. M. do not send sufficient data.—F. B. will find descriptions and illustrations of well-boring apparatus on p. 54, vol. 33.—R. and N. T. should consult Molesworth's "Pocket Book" as to tractive power required to move a vessel.—F. J. H. can brass or bronze iron castings by the process given on p. 283, vol. 31.—J. R. W. will find a recipe for black-board composition on p. 91, vol. 30.—M. L. will find a recipe for paste for fixing labels on tin on p. 253, vol. 30.—S. L. will find a recipe for bluing on p. 219, vol. 31.—J. W. C. will find recipes for hard soap on pp. 331, 379, vol. 31.—R. W. and P. P. S. can water-proof canvas by following the directions on p. 347, vol. 31.—F. L. and O. E. D. will find that the horse power of an engine was explained on p. 33, vol. 33.—D. L. will find a description of bisulphide of carbon on p. 144, 283, vol. 30.—W. R. B. will find information as to the hydrogen in water on p. 81, vol. 33.—R. D. B. can blue iron and steel by the process detailed on p. 123, vol. 31.

(1) J. D. R. asks: What is the maximum strain per square inch upon the drawbar of the locomotive attached to one of the largest passenger trains? A. It is the tractive force of the locomotive divided by the area of cross section of the drawbar. The maximum tractive force of a locomotive is the square of the diameter of the piston in inches X the length of stroke in inches X the greatest pressure in the cylinder in lbs. per square inch + the diameter of the driving wheel in inches.

(2) R. B. F. says: I have seen an engine that runs by superheated steam produced by water falling, drop by drop, upon a white hot iron surface. After the superheated steam has been used, it is turned into the fire and there is decomposed, and the hydrogen burned, the oxygen promoting the combustion. Is superheated steam decomposed on striking an open fire? A. Yes, if the temperature is high enough.

(3) G. C. S. asks: 1. What proportion of gunpowder by weight should there be to the bullet in a rifle? A. The proportion varies with the character of the shooting. 2. How large should a bullet be for a breechloading rifle, the bore of which is 0.31 inch in diameter? A. Almost equal to the diameter of the breech.

(4) W. P. says: I have a house of which the lower story is of stone (30 inches), and the upper story of brick, located on high ground. We had a destructive rain storm, and the rain drove with great force against the north end of the house, soaking through to the paper on the inner wall, causing the paper to mildew, and creating an unhealthy odor. The moisture is in the wall yet. How can I remedy it? A. The joints in the interior of the wall were probably not closely filled with the mortar, and the wall itself not provided with strips on the interior to isolate the plastering. Get a good mason to examine the wall closely on the exterior and point up again all joints that are not smooth and tight; the brick work might have two coats of paint in addition; see also that there is no means of entrance for water at the roof cornice. On the interior, if the plastering has been applied directly to the wall, the surest remedy will be to have it replastered upon strips nailed upon the present plastering.

(5) P. J. M. asks: Do we increase the friction by increasing the surface, supposing no weight to be added? A. Within ordinary limits the amount of friction is independent of the surface.

(6) W. asks: Is the back reducing gear, on a common engine lathe, any addition to the power of the machine, or is it only a convenient method of using the power as taken from the motor? A. The back gear enables heavier work to be done, and takes more power to drive than does the direct use of a belt; but the latter runs more easily and delivers a higher speed to the work.

(7) A. W. L. asks: Can a steam engine be run with water that is strongly saturated with soap? A. It might be done, but it would not be advisable.

(8) J. H. R. asks: What are the diameters of the car wheels used on the eastern roads, the width and thickness of flanges, and the weight? A. Diameter from 30 to 33 inches, width of tread and flange 5 1/2 inches, weight from 450 to 500 lbs.

(9) W. M. M. asks: What metals are there in the eagle pennies manufactured in 1858? A. Copper and nickel.

(10) J. L. says: There is a dispute in regard to the power of an eight inch stroke steam engine. Is it possible to build an engine with an 8 inch stroke that will produce 100 horse power? A. Yes.

(11) J. C. P. says: I am making a piston blower of a square box 3x3 inches inside, in which the piston will work, being driven by a belt wheel and pulley by hand, with a balance wheel on the crankshaft. The piston will have a 6 inch stroke. There is a valve in the bottom of cylinder with 1 inch opening for ingress of the air. What size of pipe and valve do I want for the discharge of air into the receiver from the cylinder? It will make about 300 revolutions per minute. A. A pipe 3/4 inch in diameter will answer. 2. How many lbs. pressure to the inch can I compress into the receiver with this machine? A. Six or seven. 3. Will it make a sufficient blast for a common blacksmith's forge? A. It will not be as efficient as some other devices.

(12) N. W. H. asks: Can live steam be seen in a boiler by inserting a glass in a hole 1 to 2 inches in diameter? A. No.

(13) J. W. asks: 1. I have a flat bottomed steamboat, 12 feet wide by 36 feet long, with a stern wheel 8 feet in diameter by 7 feet long. It makes very good time in still water and down stream, but not so well against a heavy current. Can I change the wheel to advantage? A. We could not tell you without having more data. 2. If I wish to drive it by the engine at the bow, would a shaft and bevel gear answer better than a belt and pulleys? A. You will find that gearing makes the most satisfactory connection.

(14) G. M. says: I have a packing house, and melt the heads and scrap in an iron tank, putting them in quite fresh and clean, using live steam at about 40 lbs. pressure. The lard is of a good white color, but has a burnt smell with it. How can I take it away? A. Use steam of lower pressure in future. We scarcely think that you can remove the smell from that already made. Some of our readers, however, may be able to help you with their experience.

(15) E. R. M. asks: With magnetized iron or lodestone, does the attraction vary as the square of the distance? A. Yes.

Can it be truly said that water raised by the Archimedean screw flows down a series of inclined planes? A. Yes.

Has the question of a cannon on a train, fired in an opposite direction, been discussed in the SCIENTIFIC AMERICAN? A. Yes. See p. 273, vol. 32.

(16) C. K. asks: In working a suction and force pump, all in good order, will it force more water through a hose 2 inches in diameter without a nozzle on than with a 1 inch nozzle? A. No, unless the pump leaks.

(17) H. H. W. asks: Why is a thimble skein wagon more easily drawn through mud or sand than an iron axled wagon of smaller dimensions? A. When this is the case, it must be due to difference of fitting. We doubt if it is universally true.

(18) W. P. C. asks: At what angle above the horizon should a hose be held for the furthest horizontal play? Is there a rule for calculating the relation between the vertical and horizontal play of the same stream? If a pipe is held to play vertically, and throws a stream 200 feet in that position, and is then inclined to play horizontally, how far should it throw? A. There are rules, approximately correct, to be found in any good treatise on hydraulics. The experimental data on which these rules are founded are, however, rather limited.

(19) J. F. G. asks: 1. What is the proper name for a loop in a pipe, to allow for expansion? A. An expansion joint. 2. I have made an engine of 2 1/2 inches bore by 4 inches stroke. Can you give the horse power? A. See p. 33, vol. 33.

(20) A. W. A. says: I want to run a circular saw mandril; saw is 60 inches diameter, at right angles to line shaft. To accomplish this I have thought of three modes. 1. By bevel gear. 2. By running a half twist belt from line to countershaft, countershaft running directly over line shaft, at a distance of 12 feet. The pulleys on both shafts are to be 30 inches in diameter and of 15 inches face. 3. To turn a corner by means of two loose pulleys in a perpendicular shaft belt (12 inches wide) to run direct from line round loose pulleys to countershaft. Do you think either of these plans is practicable? A. Try the second plan, if the countershaft can easily be arranged.

(21) H. C. D. asks: How many lbs. to the square inch of heated air will it require to run a sewing machine? How large should be the cylinder? What should be the size of the air chamber, and will a kerosene lighted wick be sufficient to expand the air to get the required pressure to run said machine? A. Your questions are too indefinite. It must be evident to you that either the pressure of air, or the size of cylinder, must be fixed as a preliminary operation. We do not think that you can get along with a kerosene lamp unless it is of very unusual dimensions.

(22) W. J. says: 1. I think of making an upright boiler, 13 inches in diameter and 3 feet high with 28 smoke tubes of 1 inch diameter and 1 foot long, arranged around the circumference of the boiler, and 58 circulating tubes 1 foot long, 1 inch diameter, dropping into the fire, screwed well into the crown sheet. The crown sheet is to be stayed to head sheet with four 1 inch stays, 4 1/2 inches apart, and there is to be 1 inch water space around the fire stayed with 3/8 inch stays, 3 inches apart. Shell is to be of 3/8 inch, crown and head sheets of 5/8 iron. Is this a good way to build a boiler to put in a skiff 18 feet long by 4 feet 6 inches beam? A. The boiler will answer very well. 2. What pressure steam can I safely carry? A. You can carry 100 lbs. of steam. 3. What size of engine (slide valve) will it furnish with steam? A. One 3 inches diameter by 3 inches stroke. 4. If it would drive an engine 3 inches diameter by 3 inches stroke, would it be better to put in two cylinders whose united area would equal the single cylinder? A. The single engine will be best. 5. What size and pitch of wheel would you recommend? A. Use a propeller with pitch of 2 1/4 or 3 feet.

(23) F. D. G. asks: How can I clean finger marks off ground glass? A. Try rubbing the spots for sometime with a little tripoli or benzole.

(24) E. S. D. and others.—The zinc in the battery is the positive element and the copper the negative.

(25) C. P. E. says: I have an upright boiler 20 inches in diameter by 60 inches high, with 6 two inch tubes 36 inches long. The grate is 4 inches in diameter. I am building an engine 5x5 inches; is boiler large enough for it? A. No.

(26) S. K. H. asks: Will a piece of bronze statuary, placed on a granite monument exposed to the weather, stain the granite? A. Yes; slightly.

(27) C. W. A. asks: What is the simplest galvanometer that will determine the relative intensities of the different galvanic elements? A. Take an ordinary pocket compass and wind a hundred feet of No. 18 insulated copper wire around it.

(28) E. M. B. says: I have an office telegraph of three stations, using No. 18 gage uncovered copper wire. When first put up, the wires were run as much as possible in the air, and the bell sounded fairly; but the wires being unsightly, I took them down and ran them round on the mop board; then the bell sounded, first faintly, then not at all. Battery is three Leclanché cells. I put a handful of sal ammoniac in the jar, adding water as it evaporates; the porous cell is sealed, so I have not troubled that. What is the matter? A. Insulate your wires by fastening them to porcelain knobs. 2. I have read the article on lightning on p. 145, vol. 31. Shall I connect my main lightning conductors with my 1 inch lead water pipe in the cellar, which is distant from the 9 inch iron street main about 20 feet; or shall I connect through the roof with the feed pipe of water tank which is in the attic, and of course is a continuation of the main feed pipe from cellar? A. Connect with both. The more earth connections you have, the better.

(29) W. B. H. asks: Please give a list of the metals in the order of their ability as electric conductors. A. Silver, copper, gold, aluminum, zinc, cadmium, platinum, cobalt, iron, steel, nickel, tin, thallium, lead, arsenic, antimony, mercury, bismuth, sulphur. Of alloys, brass is between cadmium and platinum, and German silver between tin and thallium. Graphite is between bismuth and sulphur.

(30) G. S. says: I am building a screw press, for which I have a worm wheel of 24 inches diameter and 2 inches pitch. The worm is 6 inches in diameter. With such a worm and wheel, how large a screw shall I require to lift 100 tons to sustain the load for 1 hour? A. This depends on the amount of power applied to the worm. 2. How can I calculate the power required to work such a press? A. Consult Haswell's "Pocket Companion." 3. Is a cast iron table 6 inches thick, 16 inches wide, and 36 inches between supports, able to bear 100 tons in the middle? A. Not with safety.

(31) E. L. C. says: 1. I am building an elliptic spur gear wheel to work on fixed centers; transverse axis is 14 inches, conjugate axis 8 inches. The wheel has 12 teeth. I soon found that the string trammels and compasses would not do for the curve, being too flat, as the pitch curves must touch on the line of centers throughout the revolution, the distance between centers being 11 inches. A. Consult Camus "On the Teeth of Wheels." 2. What is the best shape for the teeth? A. Make epicycloidal teeth.

(32) D. F. C. asks: 1. What is the proper way to set a thread tool to cut a gas pipe tap? A. By the taper. 2. If I use a lathe with a taper attachment, should the tool be set by the taper or by the face plate? A. By the taper. 3. Suppose I use a common lathe without a taper attachment, should the tool be set by the end of the tap or by the taper? A. By the taper.

(33) H. H. C. asks: Will a horizontal copper boiler, 4 inches in diameter by 10 inches long, supply a cylinder 1 1/2 x 1 1/2 inches, with sufficient steam to drive a boat 8 1/2 feet long at 4 miles an hour? A. No.

(34) M. R. says: A friend holds that a crank pin revolves on its axis when the engine is in motion, inasmuch as it is impossible for a body to present the same side first up and then down without turning on its axis. Will you give an explanation and set the matter at rest? A. We think you might find some more profitable subject for discussion. It is a very easy thing, however, to try the experiment, attaching a pointer to some part of the crank pin, if such a demonstration is required to convince any one.

(35) S. G. W. W.—It is best to have the valve of a steam engine close quickly, but it is well to have the ports closed when the piston has completed 1/2 of the stroke at the farthest.

(36) E. H. asks: 1. How can I prevent fish oil from congealing in cold weather? A. The best method is to keep the vessel containing it enveloped in some non-conducting substance, such as straw, sawdust, woolen fabrics, etc. 2. By what process can I transform it into paint oil? A. If you will send us a sample of the oil you mention, we shall be better able to answer your question. You do not state the variety.

(37) E. E. K. says: I have a well of water which is perfectly clear and has a very slight mineral taste. It is extremely hard, and rusts off the iron hoops on well buckets at a surprising rate; when boiled in an iron tea kettle, it leaves a thick rusty coating. It is found in a stratum of hard blue sandstone. What kind of water is it, and is it likely to be wholesome? A. Send us a sample of the water in question, marked plainly with your name and address, and we will test it for you.

(38) J. H. N. asks: 1. How is nitroglycerin exploded? A. It is exploded by means of electric fuses and by fulminates. 2. Is it sure to explode if struck a heavy blow? A. Yes. 3. How are the following exploded: Mercury fulminate, pyroxylin, picric acid, potassium picrate, barium picrate, strontium picrate, lead picrate? A. All these are exploded either by friction or percussion.

(39) H. A. H. asks: 1. If the conducting power of platinum is 100, what is the relative conducting power of an ordinary carbon? A. 0.0246. 2. In making a silver solution by battery process, a spongy substance was found at the cathode. What is its chemical composition, and how can I avoid its formation? A. Quantity of current too small for the solution. Increase the surface of the zincs.

(42) A. D. B. asks: How can I prepare sperm oil so as to prevent its becoming gummy and sticky when used on light machinery? A. It may be purified by agitating 100 parts oil with 4 parts chloride of lime and 12 water; a small quantity of decoction of oak bark is afterwards added to remove all traces of gelatinous matter which it retains, and the mixture is left to settle. The clear oil is afterwards agitated with a small portion of sulphuric acid, again clarified by subsidence, and washed to remove adhering sulphuric acid.

(41) W. W. B. asks: 1. How can I renovate a Philadelphia pressed brick front, which has become soiled with the weather? A. Very dilute sulphuric acid and a stiff brush are sometimes used for this purpose. 2. I tried to make the cement which you recommend as waterproof for repairing glass, namely, white shellac dissolved in 1/2 its weight Venice turpentine, but it will not dissolve. How can I do it? A. Melt them together by heat.

(43) J. M. McC. asks: How can I make marking ink of the following colors, violet, blue, green, and black? A. The various colored inks in use can be made as follows: Violet ink: 8 parts logwood and 64 parts water; boil down to one half, strain, and add 1 part of chloride of tin. Blue ink: triturate best Prussian blue, 6 parts, with solution of oxalic acid in 6 parts water, and, towards the end of one quarter of an hour or so, add gradually gum arabic 1 1/2 parts, white sugar 1 part. Green ink: digest 7 to 10 parts of the blue ink with 1 part of gamboge. Black: Fine glue 2 ozs, water 12 ozs, ivory black 1 oz. Stir well.

(43) J. C. T. asks: How can I melt old rubber car springs? A. Dissolve them in bisulphide of carbon.

(44) G. W. L. asks: What are the igniting or explosive parts of torpedoes made of? A. They are commonly made of fulminating mercury mixed in with a few pebbles, and, in some cases, a little gunpowder.

(45) J. M. says: I put a coat of boiled linseed oil on some woodwork wanting a hard surface, but it will not get hard. How can I remedy it? A. If the oil is properly thinned with spirits of turpentine, you should have no difficulty with it. The oil was probably applied while in too viscid a condition. Try again.

(46) J. H. E. says: 1. We received some sheet zinc some time since, that has large white spots on it. Is there anything that can be used to clean the zinc? A. Try a little oxalic acid or oxalchloride of zinc. If these do not answer, try a little very dilute sulphuric acid. 2. Is there anything used in soldering tin instead of acid, that will not color the tin as acid does? A. A strong solution of oxychloride of zinc is used for this purpose, although many prefer the resinous acids.

(47) W. K. J. asks: How can I harden paraffin sufficiently to enable me to turn it in a lathe? A. We know of no satisfactory method of accomplishing this.

(48) H. E. E. says: 1. In the case of the prisoners who got away from the working gang, and took charge of a passing freight train, compelling the engineer to get off, how is it that the pump caused the bursting of the cylinder heads? A. If the pump continued working, it soon filled the boiler, and then the water was carried over into the cylinders, filling the steam pipe and steam chest, so that either the engine must stop or the cylinder be broken to allow it to escape.

(49) J. M. R. asks: How can I preserve celery through winter? A. Place it in the ground so deep that the frost will not touch it, and cover with straw.

(50) C. M. & S. say: If there is one pump with piston and suction pipe having the same area, say 4 square inches each, piston to be lifted 10 feet per second, and another pump, suction pipe same area as above, 4 square inches, piston 40 square inches moving 1 foot high per second, there being the same space to be filled (480 square inches) in each pump in the same time, one piston moving 10 times faster than the other: What difference would there be in the required driving force? A. Disregarding the friction of the piston and stuffing boxes, the two pumps would require similar amounts of power for their operations.

(51) O. B. & D. say: We would like you to tell us what size of cylinder of engine will be required to tongue and groove 6,000 feet of 6 inch yellow pine flooring, and to run a sliding saw to split 6,000 feet of 1 inch lumber 6 inches wide into siding, per day of 10 hours? A. You will require an engine capable of exerting from 12 to 15 effective horse power.

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

G. M. A.—The globular formation is marcasite white iron pyrites. The other mineral contain silica, alumina, potassa, soda, magnesia, iron, carbon, and water. We judge it to be a variety of slate. No silver was found in it. Use the cupel to determine the amount of silver in an ore.—A. D. M.—Your coal with spots on it gave none of the indications of paraffin.—S. S.—It is most probably a medicinal preparation. It is principally a compound of zinc. Consult the Dispensatory as to the application and medical uses of the zinc salts.—R. A. M.—It is calcite. For its uses consult an encyclopedia.—R. P.—No. 1 is decomposed quartz rock colored by oxide of iron. No. 2 is carbonate of lime and magnesia.—W. H. D.—They are aragonite (carbonate of lime). The primary form of crystallization of carbonate of lime is the rhombohedron: in these specimens the crystals are six-sided prisms, and consequently dimorphous.

M. & O. say: We have been heating a die which was faced with steel 1/2 inch thick, on iron

The steel became of a bright red, and the iron was still perfectly black, forming a distinct line around the die at point of welding. Can you give us a reason for the same?—G. G. F. asks: What will remove the gloss that black cloth is subject to by wear?—W. C. C. asks: How can I prepare cotton netting to prevent its shrinking and stretching when exposed to the weather?—L. B. H. asks: Is it possible to make brook trout lay their spawn when confined in a well, if they have a suitable gravel bed?—E. L. P. asks: How are the pivot jewels of watch arbors applied and set?

COMMUNICATIONS RECEIVED.

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

- On the Potato Bug. By P. Y.
On Cider. By A. P.
On the Keely Motor. By S. B.
On the Origin of Life. By J. B. P.
On Meteorology. By J. H. T.

Also inquiries and answers from the following:
W. A. S.—J. H.—C. H. P.—O. P. S.—J. D. B.—
T. N. M.—S.—O. B.—W. A. C.—M. N.—A. B. C.—
A. T. W.—J. W.

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.

Inquiries 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 inquiries analogous to the following are sent: "Who makes hand organs? Who is the best boiler incrustation preventive? Who sells the best covering for boilers and steam pipes? Who sells stills, suitable for distilling oil of sassafras? Who makes water motors? Who buys sumac for tanning and dyeing? Who sells iodate of calcium? Who sells nickel plates and salts? Who sells spectroscopes? Who sells stencilled designs for frescoing? Who sells match-making machinery? Who publishes a book on fruit culture? Who sells hand pumps? Who sells mica in plates? Who sells boilers made of corrugated iron? Who sells bicycles? Who sells gas blowpipe nozzles? Who sells machines for steaming feathers?" All such personal inquiries 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.]

INDEX OF INVENTIONS

FOR WHICH
Letters Patent of the United States were
Granted in the Week ending
July 13, 1875.
AND EACH BEARING THAT DATE.
(Those marked (r) are retained patents.)

Table listing inventions with names and page numbers, including: Acids, carrier for, F. H. Kalbfleisch; Alarms, circuit for electric, G. A. Hagemann; Aquarium, J. Wenmackers; Auger handle, F. Wertz; Bag holder, J. James; Bale tie, P. R. Dawson; Barrels, tapping, J. Barrett; Basin faucet, J. F. Sheridan; Basket, grain, H. C. Jones; Baskets, stove, H. C. Jones; Battery, galvanic, G. L. Leclanche; Bearing, conical roller thrust, M. C. Bullock; Bed lounge, T. Q. Hall; Bedstead, folding, H. Kriete; Bee hive, H. Penoyer; Billiard cue tip fastener, C. Gravelius; Boiler feed apparatus, N. Yagu; Bolt trimmer, A. Graham; Bolt die, J. B. Clark; Book support, W. Patton; Boot-cripping machine, J. P. Mitchell; Boot peg cutter, G. L. Ellis; Boot stretcher, O. F. Garvey; Boot fronts, cutting, J. T. Harper; Boot jack, A. N. De Baun; Boots, machine for pegging, T. T. Prosser; Boring and mortising machine, H. Neumann; Bracket stand, A. B. Denison; Brick, air-dried, J. Wurzet; Broom, corn, A. Maurer; Broom corn-sizing machine, A. Walrath; Brushes, attaching handles to, Hood & Joseph; Bucket, elevator, J. B. Cilne; Buckle, W. Leser; Buckle, trace, A. G. Dodds; Bureau and washstand, W. S. Moses; Burner, vapor, J. Benson; Button fastening, P. Sues; Buttons, manufacture of, R. H. Isbell; Car brake, J. E. Worthman; Car coupling, W. E. Bell; Car coupling, J. Dinmore; Car coupling, E. M. Law; Car coupling, Outland & Thomas; Car spring, J. E. Wootten; Car ventilators, regulating, G. W. Birmingham; Cars, door for grain, F. J. Kimball; Carbureter, air, Gray & Lusby; Cellars, etc., ventilating, J. K. Frick; Chain cable, C. A. Chamberlin; Chair, barber's, J. Ott; Chairs, detachable seat for, W. W. St. John; Churn, rectiprocating, Goodnough & Drennen; Clock, calendar, A. A. Cowles; Clock, calendar, W. A. Terry; Cloth-cutting machine, A. Warth; Cloth, etc., steaming, W. Heddon.

Table listing inventions with names and page numbers, including: Coal chute, W. M. Thompson; Coal scuttle, R. M. Steele; Cooler, lard, F. E. Rockstroh; Cooler, liquid, B. F. Shaw; Corn stalks, cutting, T. O'Bryan; Corset, M. K. Bortree; Cracker machine, G. W. Baker; Culinary vessel, J. Demoss; Cultivator, Dunnivant & Hampson; Digger, potato, J. W. Haag; Door check, J. Naughten; Door spring, J. B. Starkweather; Dredging machine, R. R. Osgood; Drilling machine, rock, M. C. Bullock; Drilling machine, E. S. Winchester; Duster, feather, H. L. Harrison; Egg beater, T. Earle; Egg beater, J. Howes; Elevator, H. W. Brinckerhoff; Engine house gong, R. Bragg; Engine, hydraulic hoisting, G. M. Gerrish; Engine, rotary, S. Gibson; Envelope machine, J. Ball; Eraser holder, W. H. Bennett; Exhaust mechanism, G. Bonker; Eyeglass, I. Kahn; Fabrics, imitation, C. H. Kneller; Fare box, G. J. Hill; Fence, portable, M. Burtless; Fence post, E. Geer; Fence wire stretcher, Brown & Cramer; Filter, H. F. Scherr; Fire lighter automatic, M. Curran; Fire place, M. Fitzpatrick; Fire place, J. McHenry; Floor clamp, E. Hickman; Flower stand, S. Vanstone; Furnace, metallurgic, W. Swindell; Furnace, smelting, H. C. Creal; Furnaces, nozzle for hydrocarbon, H. Stacey; Furnaces, blast pipe for, G. H. Goodsell; Game board, C. R. Edwards; Gate, automatic, O. P. Clinton; Gate, automatic, K. G. Knuteson; Goods, etc., transmission of, D. Brown; Grave cover, R. H. Spies; Gun stocks, checking, J. A. Blake; Handle attaching device, Hood & Joseph; Harrow, A. W. Davis; Harvester, C. Wheeler, Jr.; Harvester dropper, T. McDonough; Harvester safety seat, W. E. Mattison; Hatchway, self-closing, J. Fensom; Heel polishing machine, W. Westcott; Hinge, F. L. Sanderson; Holdback, W. H. Harvey; Hoops, machine for cutting, H. Fowler; Hose coupling, W. M. Henderson; Hose, india rubber, T. J. Mayall; Hubs to axles, attaching, W. E. Pratt; Hydrocarbons, test for, J. Ponton; Ice cream freezer, J. M. Condon; Ice cream freezer, W. Redheffer; Ice plow, R. W. Sanborn; Jack, lifting, Fayette & Meeker; Ladder, firemen's extension, A. Ames; Ladder, firemen's extension, J. D. Rowland; Lamp and gas machine, G. T. Parry; Lamp, nursery, Gorham & Culey; Lamp reflector, street, C. Robinson; Lathe, metal turning, H. M. Quackenbush; Lemon squeezer, A. C. Weeks; Life preserver, J. F. Peck; Liquids, drawing effervescent, C. Greiner; Liquids, evaporating, G. A. Hagemann; Lock, W. H. Taylor; Locomotive head light, Ray & Ham; Lock shells to cases, fastening, H. Winn; Loom, pile fabric, S. Sanford; Lock picking mechanism, D. M. Collins; Measuring apparatus, liquid, J. M. Hopkins; Measuring distances, etc., E. C. Roberts; Meat cutter, R. P. Goodard; Meat cutter, A. B. Good; Metal punching machine, D. W. Baer; Miner's tools, Holmes & Quirin; Molding instrument, D. Walther; Mop, Johnson & Barnes; Mowing machine, D. Lockhead; Mowing machine, C. Wheeler, Jr.; Muff, E. Winkler; Nail for shoemaking, L. R. Blake; Nail rolling machines, conductor for, R. E. Cady; Neck tie, A. Hellenberg; Neck tie, A. Lodes; Neck tie, S. Soloman; Neck tie fastener, J. H. Harrington; Needle sharpener, T. D. Cashin; Needles, polishing eyes of, J. Berry; Newspaper file, F. B. Alderson; Ore concentrator, G. W. White; Ore separator, H. P. Minot; Paperclip, C. E. Ramus; Paper weight, F. E. Whitney; Pavement, M. R. Bellamy; Pegging machine, T. T. Prosser; Pianoforte damper mechanism, E. Porter; Pick, T. R. Pinks; Pipes, thawing frozen water, R. E. Dietz; Planing machine, miter, J. Mannebach; Planter and cultivator, corn, P. S. Starnes; Plow, W. S. Lawrence; Plow, gang, H. Opp; Plow mold boards, making, J. Holmes; Pneumatic machine, C. A. Hagemann; Press, J. P. Kefauver; Printing press, M. A. Pendleton; Protractor, A. Swasey; Pump, S. B. Strong; Pump, bilge, J. F. Smethells; Pump, rotary, H. A. Barber; Pump link, L. W. and C. Olds; Resawing machine, E. Benjamin; Saccharine solutions, filtering, Watson et al.; Safe door, N. Macneale; Saw guide, band, Young and Ferguson; Sawing machine, band, B. D. Whitney; Saw mill, W. T. Wayne; Sawset, J. E. Whiting; Scales, trileaf, Crane and Miner; Seed drill, W. A. McClintock; Seed sower, J. Burke; Separator, grain, W. S. Clymans; Sewing machine shuttle, C. E. Billings; Sewing machine, E. Benjamin; Sewing machine, shoe, E. P. Richardson; Shaft coupling, A. B. Cook; Sheetmetal spouts, making, M. S. Leidy; Ship's galley, Lusby and Smith; Shoemaking, nails for, L. R. Blake; Shoe sole machine, J. W. Lefferts; Signals, circuit for electric, Hall and Snow.

Table listing inventions with names and page numbers, including: Skiving and splitting belts, J. W. Fifield; Sleighs, lance for propelling, A. Corbett; Sleighs, runner for, H. Smith; Snow plow, E. G. Graves; Soap, S. Strunz; Soap, transparent advertising, S. Strunz; Spindle, lubricating, A. M. Wade; Spoke socket, J. B. Blatt; Stamps, etc., attaching, E. T. Thomas; Stone and cement, A. Boag; Stone and marble dressing, O. Abell; Stool, G. C. Winchester; Stove, J. L. Roberts; Stove and heat radiator, N. H. Lenharr; Stove, heating, H. G. Giles; Stove pipe drum, B. F. Stockford; Straw cutter, C. F. and M. Stewart; Table, folding, J. Walton; Table, ironing, C. Rumens; Table slide, extension, L. N. Willard; Tables, slider for extension, A. Weaver; Teeth protector, A. Hopfen; Telegraph, automatic electric, W. E. Sawyer; Telegraph lines, underground, D. Brooks; Telegraph, fire alarm, J. W. Kates; Telegraph relay, pocket, Hill and Schneider; Thermostat, electric, E. J. Frost; Thermometer, registering, J. V. Raymond; Ticket case, W. H. Crowther; Ticket case, Crowther and Collins; Tobacco mouth piece, B. Morahan; Trap, animal, H. H. C. Arnold; Trap, animal, J. M. Wilkinson; Tree box, E. Russell; Valve, globe, H. P. Buffon; Valve, stop, J. O. Morse; Vehicle spring, S. E. Foster; Vehicle spring, W. F. Whitney; Vehicle wheel, S. L. Bond; Vehicle wheel, C. Jeantaud; Velocipede, ice, C. M. Day; Wagon brake, Garth and Rosser; Wagon brake, W. Lackman; Wagon or sleigh, dumping, J. Pattison; Washing machine, J. H. Harris; Washing machine, J. D. Lawlor; Washing machine, S. P. Loomis; Washing machine, E. H. F. Schneider; Watch key combination tool, O. D. Warfield; Water closet seat, F. Fabj; Water closet, I. Riley; Weather strip, Hoffman and Shoemate; Wick trimmer, D. T. Bates; Windmill, W. Walker; Windmill apparatus, etc., Richardson et al.; Window frame, E. Roth; Window scaffold, A. T. Large; Wood, machine for splitting, J. A. Conover.

DESIGNS PATENTED.

8,476 to 8,480.—CARPETS.—J. Webster, Philadelphia, Pa.
8,481.—LAMP PEDESTALS.—N. Bradley, West Meriden, Ct.
8,482.—PAPER WEIGHT.—H. Lee, New York city.
8,483.—HEATING STOVE.—R. Scorer et al., Troy, N. Y.
8,484.—STOVE COVER LIFTER.—H. Brown, New York city.
8,485.—PRINTING TYPE.—A. Little, New York city.
8,486.—RUBBER ERASER.—C. Roberts, Newark, N. J.
8,487.—BROOM HEAD NECK.—C. Van Slyck, Schenectady, N. Y.

SCHEDULE OF PATENT FEES.

Table listing 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 filing a Disclaimer \$10; On an application for Design (3 1/2 years) \$10; On application for Design (7 years) \$15; On application for Design (14 years) \$30.

CANADIAN PATENTS.

LIST OF PATENTS GRANTED IN CANADA,
July 8 to 14, 1875.

Table listing Canadian patents with names, locations, and dates, including: 4,956.—J. Collins, Guelph, Ont. Feed cutter. July 8, 1875.
4,957.—J. P. Connell, Kensington, Conn., U. S. Door bell. July 8, 1875.
4,958.—D. Whiteside, Toronto, Ont. Carpet cleaning machine. July 8, 1875.
4,959.—J. Bates, Thornbury, Ont. Combined clothes dryer, desk, and table. July 8, 1875.
4,960.—T. S. Church et al., Boston, Mass., U. S. Cleaning furniture, etc. July 8, 1875.
4,961.—J. M. Gill, Brockville, Ont. Permutation lock. July 8, 1875.
4,962.—J. Clark, Greenpoint, N. Y., U. S. et al. Furnace grate bar. July 8, 1875.
4,963.—J. C. Chase, Rutland, Ohio, U. S. Washing machine. July 8, 1875.
4,964.—Phoebe Edmonds, Rochelle, Ill., U. S. Churn. July 9, 1875.
4,965.—J. Filion, St. Eustache, P. Q. Stumping machine. July 12, 1875.
4,966.—A. D. Cole, Toronto, Ont. Turbine waterwheel. July 12, 1875.
4,967.—R. C. Harris, Dalhousie, N. B. Snow excavator. July 12, 1875.
4,968.—C. D. Van Allan, West Farnham, P. Q. Churn and washer. July 12, 1875.
4,969.—A. L. Blackman, Nashville, Tenn., U. S. Wheel machine. July 14, 1875.
4,970.—A. Davis, Belleville, Ont. Lubricating locomotive cylinders. July 14, 1875.
4,971.—M. Hubbell, Mountisco, N. Y., U. S. Horse collar and harness. July 14, 1875.
4,972.—W. B. Wright, Toronto, Ont. Barber's chair. July 14, 1875.
4,973.—P. Baker, Lockport, N. Y., U. S. Sash supporter and lock. July 14, 1875.
4,974.—G. Henry, Lennoxville, P. Q. Regulator for feed apparatus. July 14, 1875.
4,975.—E. Fuller, Caledon, Ont. Bridle. July 1875.
4,976.—M. Fox, New York city, U. S. Reversible cap. July 14, 1875.
4,977.—J. E. Finley, Memphis, Tenn., U. S. Hard corn sheller. July 14, 1875.
4,978.—C. H. Orcutt, Leominster, Mass., U. S. Cutting and skiving leather. July 14, 1875.
4,979.—C. Robinson, Eau Claire, Wis., U. S. Trace fastening. July 14, 1875.
4,980.—J. W. Beattie, Brooklyn, N. Y., U. S. Illuminating gas. July 14, 1875.
4,981.—C. Russ, Beamsville, Ont. Stop motion for harvester. July 14, 1875.