(18) S H. L. says: I have some very soft castings of iron; while cutting a thread on them, all the cuttings stand on end. What is the cause? A. Magnetism, created by friction produced by using a dull tool.

(19) W. H. G. asks: 1. What will be the effect of carefully retempering a good quality of steel, say a tap 1½ inches in diameter and 15 inches long, carefully repeating the tempering 5 times? Will the rise of thread be increased or decreased? A. No. 2. Will the cutting quality be affected? A. Yes, it will deteriorate.

(20) E. H. says: I am an engineer on a tug; her boiler is constructed in locomotive fashion, with 42 flues 2¼ inches in diameter; firebox is 4x3 feet. The flues in the firebox end leak constantly. If I stop them and blow out, they stop leaking, but commence to leak again as soon as I have occasion to carry a hot fire. A. Probably the tubes are too close together, so that the circulation is imperfect. If so, more moderate firing and steaming will doubtless be the only remedy.

(21) O. G. B. asks: What is the best mode of constructing a firebox under a horizontal tubular boiler to burn slabs and sawdust? The boiler is 48 inches in diameter and 10 feet long, with 36 three inch tubes. What length and width of grate surface would be required? A. Make the furnace from ¼ to ⅓ larger than for burning wood. See p. 59, vol. 3C.

(22) J. C. C. asks: 1. What disadvantage is there in a small upright double cylinder engine with both cranks on one shaft? I do not hear of any such being made. A. There are many such engines in use, but ordinarily a single engine is considered simpler. 2. What power could I get from such an engine, the cylinders being 2 inches in diameter and of 4 inches stroke? A. Horse power=pressure on piston in lbs. per square inch × speed of piston in feet per minute÷33,000. 3. What would be the best way to set the valves to get the most power? A. Cut off steam at about ¾ of the stroke. 4. In what relation to each other would it be best to set the cranks? A. At right angles. 5. Will brass wear as long, for the cylinder and other working parts, as iron? A. Yes. 6. Will the double cylinder engine give more power than one cylinder, of the same piston surface as both? A. No. How can I make a writing fluid that is green when first written with, but turns black on drying? A. Take 15 parts by weight bruised gall nuts, and 200 parts water. Boil for an hour, and then add 5 parts sulphate of iron, 4 parts iron borings, and 1 part indigo dissolved in 3 parts sulphuric acid.

(23) H. H. H. asks: What is the weight on the crosshead of a 10x20 inches engine, with connecting rod 60 inches long and pressure 50 lbs.? Please give the rule. A. The pressure of the steam in lbs. per square inch, multiplied by the area of the piston in square inches. To this must be added the weight of the moving parts, when they act so as to increase the strain.

(24) B. R. F. asks: What is the best means of cleaning a basement of roaches? A. Put 1 drachm phosphorus into a flask with 2 ozs. water, plunge the flask into hot water, and when the phosphorus has melted pour the contents of the flask into a mortar with 2 or 3 ozs. lard. Triturate briskly, adding water and ½ lb. flour, with an ounce or two brown sugar. This paste is said to effectually destroy roaches.

(25) H. J. M. says: I want to construct a small boiler for driving light machinery. Will tin plate stand a pressure of 15 lbs. per square inch, the boiler being 2 feet square by 6 inches deep? A. You can use tin if you make the boiler cylindrical, from 8 to 9 inches in diameter.

What are the yellow shining particles in the piece of stone enclosed? A. It is mica.

(26) M. A. J. asks: Will a wrought iron rod, after being heated a number of times from 70° to 212° Fah., cease to be affected as to contraction and expansion by the heat? A. Any material under these conditions will have its coefficient of expansion affected in time, and after long use may cease to be sensibly influenced by change of temperature. It is a general law that all machines, including animal mechanism, wear out in course of time.

(27) R. H. J. asks: How many gallons will flow per minute through a ¾ inch nozzle on a 3 inch hose, with 40 lbs. pressure per square inch? A. About 7 cubic feet. 2. How much will flow through a ⅝ nozzle on a 2 inch hose with the same pressure? A. About 1·5 cubic feet.

(28) D. C. C. asks: 1. I have been running an engine 22 by 24 inches stroke, with a 9 foot flywheel, making 120 turns per minute. How can I find out how many horse power this engine is? A. The only way to ascertain the power definitely is to make an experiment with a brake or dynamometer. 2. Can the steam make any difference in the power when it makes the same number of strokes per minute with 40 lbs. as with 80 lbs.? A. The steam is, no doubt, wire-drawn, if the engine does as well with 40 as with 80 lbs. of steam.

(29) C. R. asks: Can I burn a hole about 7 inches in diameter through a cast iron plate nearly 1 inch thick, by the use of the oxyhydrogen blowpipe? I cannot get at it to drill it. A. It could be done, but it would be very expensive. We think that if you can reach it with a blowpipe you can probably devise some arrangement to attack the material with a tool.

Will soluble glass do to coat a tin vessel with so as not to be corroded by sulphuric acid? A. Yes.

(30) H. B. B. asks: If the tensile strength of cast iron is 15,000 lbs. per square inch, how will a fly wheel rim of 1 square inch sectional area sustain 30,000 lbs.? A. If the 30,000 lbs. is tensile strain, and the tensile strength of the material is 15,000 lbs., of course the wheel would not resist it.

(31) H. W. G. asks: Why do kerosene lamps, especially those made of brass, sweat oil, or why does oil collect on the sides of lamps filled with kerosene? A. It is due to the evaporation of the oil drawn up through the wick by capillary attraction while the lamp is not in use, which is condensed in part upon the cold surfaces of the lamp. Try an airtight cap.

(32) H. R. E. asks: Can you give me a recipe for an ink for writing on zinc, that will stand the action of sulphuric acid? A. No. The sulphuric acid will dissolve the zinc at once.

(33) F. M. asks: Is there any way to temper machinists' tools, such as straight edges and squares, without warping them? A. Make them out of old saw blades, which require no tempering.

(34) F. B. S. asks: How can I make the eggs of Pharoah's serpents? A. These are little cones of sulphocyanide of mercury which, when lighted, give forth a long, serpent-like, yellowish brown body. Prepare nitrate of mercury by dissolving red precipitate in strong nitric acid as long as it is taken up. Prepare also sulphocyanide of ammonium by mixing 1 volume sulphide of carbon, 4 strong solution of ammonia, and 4 alcohol. This mixture is to be frequently shaken. In the course of about two hours, the bisulphide will have been dissolved, forming a deep red solution. Boil this until the red color disappears and the solution becomes of a light yellow color. This is to be evaporated at about 80° Fah., until it crystallizes. Add little by little the sulphocyanide to the mercury solution. The sulphocyanide of mercury will precipitate; the supernatant liquid may be poured off, and the mass made into cones of about half an inch in hight. The powder of the sulphocyanide is very irritating to the air passages, and the vapor from the burning cones should be avoided as much as possible. To ignite them set them on a plate or the like, and light them at the apex of the cone.

(35) W. S. H. asks: How can I temper a thin circular saw, about 2 inches in diameter and $\frac{1}{64}$ thick, without springing it? A. Heat red hot, place between two flat perforated iron plates, and lower into oil, quenching right out.

(36) N. R. asks: How are wood screws cut? I have made a die that cuts the thread well enough, but I cannot form a point. A. This is done by a special patented machine.

(37) H. P. G. and others ask: 1. What is the nature of an explosion of gunpowder? Does it press equally in all directions? A. The effect of an explosion of gunpowder is simply due to the sudden conversion of the grains from the solid into the gaseous state. With gunpowder we have a volume of gas, which would normally occupy a space three hundred times as great as the grains occupied, liberated rapidly, but still in a perceptible interval, and for this very reason gunpowder is the safest projectile agent thus far discovered. For if, as in the case of nitro-glycerin, this large volume of gas were liberated all but instantaneously, the strain upon the gun would be so great that it would, in all probability, burst the breach before it started the ball. 2. Why does not the ramming, in blasting rocks, blow out before the rock splits, for it cannot possibly be made stronger than the rock? A. See answer to A. J. K., on this page.

(38) A. J. K. says: A sand blast is made by pouring dry sand upon the powder in a drill hole. When the powder is exploded, why is the loose sand not driven out, and the rock left uninjured? A. The pressure of the gas at the moment of its liberation is, of course, equal in every direction. It must also be borne in mind that before this volume of gas has expanded to the density of the atmosphere it must have displaced a column of air which exerts a pressure of something over a tun on every square foot of surface. With nitro-glycerin a volume of gas, 900 times that of the liquid used, is set free all but instantaneously. It can readily be seen that the sudden development of this large volume of gas, which becomes at once a part of the atmosphere, would be equivalent to a blow by the atmosphere against the rock; or, what would be a more accurate representation of the phenomenon, since the air is the larger mass, and acts as the anvil, a blow by the rock against the air.

(39) F. B. asks: Will an explosion of unconfined nitro-glycerin upon the surface of a rock split it? If so, why? A. Take a light wooden surface, say one square yard: the pressure of the air against the surface is equal to about 9 tuns, but the air presses equally on both sides, and the molecules have such great mobility that, when we move the surface slowly, they readily give way, and we encounter but little resistance. If, however, we push it rapidly forward, the resistance greatly increases, for the molecules must have time to change their position, and we encounter them in this passage. If now we increase the velocity of the motion to the highest speed ever attained by a locomotive, say one and one fifth miles per minute, we should encounter more particles, and find a resistance which no human muscle could overcome. Increase the velocity ten times, to twelve miles a minute, (the velocity of sound) and the air would oppose such a resistance that our wooden board would be shivered to splinters. Multiply again the velocity ten times, and not even a plate of boiler iron could withstand the resistance. Multiply the velocity once more by ten, and we should reach the velocity of the earth and its orbit, about 1,200 miles a minute, and, to a body moving with this velocity, the comparatively dense air at the surface of the earth would present an almost impenetrable barrier, against which the firmest rocks might be broken to fragments. Indeed this effect has been several times seen, when meteoric masses moving with these planetary velocities penetrate our own atmosphere. The explosions which have been witnessed are simply the effect of the concussion against the aeriform anvil at a point where the atmosphere is far less dense than it is here; so in the case of nitro-glycerin, the rock strikes the atmosphere with such a velocity that it has the effect of a solid mass, and the rock is shivered by the blow.

(40) E. W. P. asks: 1. What will dissolve gutta percha? I have tried naphtha, but without success. A. Gutta percha is dissolved readily by benzole, chloroform, bisulphide of carbon, oil of turpentine, and the essential oils generally. 2. Will it answer for mending rubber? A. Yes.

(41) J. H. H. asks: 1. Can you give me information as to the temperature required to melt copper, zinc, lead, iron, and brass? A. Copper 1990° Fah., zinc 773°, lead 617°, cast iron 2780°. The melting point of brass is variable, and depends altogether upon the proportion of its ingredients. 2. How can I make insulated wire for battery use? A. Coat copper wire with gutta percha.

(42) E. says: I have a fine oil painting of the Madonna and Child. It is 30 years old; and from age and ill usage it has become badly cracked. Is there any preparation by which these cracks can be hidden or taken out? A. Its appearance would be improved by careful retouching and varnishing. The taking out of a crack is not possible.

What kinds of colors are used for coloring stereoscopic views? A. Aniline colors are used.

(43) S. G. R. asks: 1. In preparing glycerin we make a lime soap. What is the cheapest and best way of converting that into soda soap? A. Who makes such a lime soap with glycerin? Glycerin forms soluble compounds with lime and soda. 2. What is the best work on the manufacture of soap? A. Morfit's book has a high reputation.

(44) A. S. M. asks: How can I make muffles for baking a charcoal composition in, to render it porous for filtering purposes? A. Muffles are earthenware ovens, usually formed with an oval top and flat bottom. They open at one end and are closed everywhere else, except a few narrow slits in the top and sides.

How is rubber made to retain flock, for piano covers? A. The flock is rolled on while the rubber is in a softened state, by passing between two revolving cylinders heated by steam.

(45) J. M. McC. says: We have a large cistern under a factory, for the purpose of holding rain water for scouring, etc., which has lately been filled partially with hard water, but principally by rain. After letting it stand a few days, we have used said water and it really seems as hard as the well water. Please to inform me why this is? We are confident that it is more than half soft or rain water. A. It is probable that there were sufficient lime salts in the hard water to make all the water in the cistern hard, when the waters mingled together.

(46) P. O. T. asks: In estimating the percentage of tannin in bark, leaves, etc., by means of protochloride of tin and muriate of ammonia, how is the resulting precipitate measured? A. By means of a glass-stoppered cylindrical jar, properly graduated to cubic centimeters.

(47) L. A. W. asks: What is the real cause of the fulling up of flannel by washing? A. It is due to a combination of causes, but principally to the rubbing; and where soap is used, this action is very much accelerated.

(48) W. A. P. asks: What is Berlin bronze, and how is it applied on cast iron? A. The trade does not seem to be familiar with the name.

(49) J. H. P. asks: There is something that is put in tincture of iodine, so that, when the latter is applied to the skin, it leaves no stain. What is it? A. The tincture (so-called) referred to may be obtained by adding, to the alcoholic solution of iodine, ammonia or hyposulphite of soda.

What can be put into ink that will give it a fine gloss, something like a varnish gloss? A. Add some sugar of milk.

(50) G. B. McD. asks: 1. Are platina and platinum the same? A. Yes. 2. If 10 ozs. 225·6 grains silver be melted with 28 ozs. 0·014 grains platinum, what will the nature of the alloy be as to malleability, ductility, and specific gravity? What will be the melting point of the above alloy? A. Only a trial will answer this, as the properties, etc., of the two bodies are not found in the alloy. 3. Can copper be successfully electro-plated with steel? A. No. 4. How can I procure a list of dates and number of patents issued by the Patent Office since 1858? A. This list will be found in the volumes of the SCIENTIFIC AMERICAN.

(51) P. S. asks: What is ground lime composed of? A. You probably mean sulphate of lime or gypsum, also known as plaster of Paris, which is a combination of lime and sulphuric acid. Gypsum, which has been dried at a temperature at from 400° to 500° Fah, and ground to a fine powder, has the peculiar property, when mixed with water, of recombining with the water, and binding or setting into a hard mass. To this property plaster of Paris owes its value in the arts.

(52) J. T. asks: Why does a sunbeam, admitted into a darkened room through a square, triangular, or other aperture of irregular contour, always form a circular or oval image on the floor or opposite wall? A. In case the opening is of sufficient size, the image will be of the same form as the opening; but when small, other rays enter besides those moving in parallel lines, and (by crossing) approximate the form of the image to a circle.

Observation seems to have given rise to and to confirm a theory that the nearer to the hour of noon the moon changes, the greater is the probability of foul weather; and the nearer to the hour of midnight this occurrence takes place, the greater the probability of fair weather. On what principle is this theory based? A. No satisfactory explanation of these phenomena is given, and the accuracy of these observations is open to grave doubts.

At a certain elevation, above the lower portions of the earth and beneath the summit of the higher portions, there is a line termed the thermal line, because the stratum of the atmosphere at that hight is warmer than the strata either above or below it. What is the cause of a greater heat in this stratum than is found elsewhere? A. The existence of this thermal line has only been made known recently; and until the investigations of Glaisher and others are more advanced, explanations would be mere guesswork.

Do rays of light from the sun approach the earth in straight lines? If they do not, in what kind of lines do they approach it? A. They move in straight lines until they encounter the earth's atmosphere, when they are bent into irregular curves by the different refractive powers of the various strata of the atmosphere.

(53) H. C. Z. asks: What am I to use to soften hard rubber balls? A. Boil them for some time in soft water.

What can I use to give old books a better appearance? A. We do not know.

COMMUNICATIONS RECEIVED.

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

On Proportioning Gears. By T. A. C.
On Parasites. By D. V. D.
On Tides. By E. S.
On Hard Rubber Thermometers. By J. M. B.
On Salicylic Acid. By G. H. B.
On Science and the Pope. By G. R.
On Dentistry. By S. B. P.
On the British Patent Laws. By A. H.

Also enquiries and answers from the following.

F. C. R.—T. F. W.—T. H. P.—E. G. W.—J. B. C.—W. B. H.—W. G.—O. B. T.—A. R. F.—J, W. N.—T. C—F. R.—S.—T.

HINTS TO CORRESPONDENTS.

Correspondents whose inquries 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: "Who sells insulated copper wire? Who makes woolen textile machinery (pickers, breakers, and finisher cards)? Who makes horseshoes with movable calks? Who makes balanced slide valves for locomotive use? Who manufactures toy balloons? Who sells platinum, and what is its cost?" 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.]

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Plow, gang, J. A. Sutherland 162,116
Plow, sulky, L. W. True 162,126
Poker and tongs, J. C. Libe 162,080
Portfolio, J. W. Eastwood 161,872
Press for concrete blocks, T. Cook 161,867
Press, hay, J. Dugan 161,871
Press platen, lever, J. F. Taylor 162,121
Printer's type case, L. A. Martin 162,084
Propeller, screw, J. Harrington 162,063
Pulley or gear wheel, reversing, H. W. Sherrill 161,986
Pump, air, W. H. H. Bowers 162,021
Pump, steam, J. Tesseyman 162,122
Pump bucket, chain, J. G. Henderson 161,881
Pump bucket, chain, W. H. Kelly 161,967
Pump pitman connection, J. M. Langley 161,971
Punch, conductor's, O. T. Hungerford 162,071
Punch, metal, D. L. Kennedy 161,968
Purifier, middlings, L. Gathmann 161,875
Radiator, J. Reynolds 162,100
Radiator, steam, W. H. Shock 161,907
Rafting crib, C. W. Tobey 162,124
Railway switch, W. A. Weant 161,918
Rain water cut-off, M. Gmeiner 162,058
Rake, horse hay, J. E. Wisner 162,132
Refrigerator, W. P. Butler 161,928
Regulator, etc., steam pressure, J. E. Watts 161,917
Rocker, child's, A. Schoeninger 161,905
Roundabout, J. C. Clime 162,032
Saddle, gig, A. Ortmayer 162,095
Sash fastener, T. J. Carroll 161,929
Sash fastener, J. K. Clark 162,031
Sash fastener, I. D. Woolf 162,000
Saw mill, circular, F. M. Covell 161,935
Sawmill, circular, J. W. Miles 162,088
Saw set, R. J. Granville 161,950
Saw teeth, W. P. Hale 162,061
Saws, handle for cross-cut, W. J. Boynton 162,022
Scales, H. T. Budge 162,024
Sewing machine, C. H. Palmer 161,895
Sewing machine cover, R. W. Whitney 162,127
Sewing machine hemmer, J. W. Robards 162,102
Shears, button hole cutter, etc., Carter & Rhoades 162,029
Sheet metal measure lip, A. Cummings 162,037
Sheet metal threaded collars, A. Taplin 161,912
Shoe last block lock, F. J. Davis 162,038
Shoe shave, D. Harrington 161,958
Shoes, cork sole for, C. Thackerey 161,994
Signals, operating and locking switch, S. H. Finch 161,940
Skate, J. D. Kellogg, Jr. 161,863
Sower, seed, J. W. Talley 161,991
Spark arrester, Humphreys & McCleary 162,070
Spice box, W. A. Wicks 162,130
Spike, C. K. Marshall 161,975
Spinning machine spindle, J. H. Le Moyne 161,888
Spinning ring blank, Forehand & Wadsworth 161,943
Stalk cutter, J. Y. Eckman 161,873
Steam and air brake, Burt & Little 161,927
Stocking heels, re-enforcing, A. C. Carey 162,028
Stone, blocks of artificial, T. Cook 161,866
Stove, cooking, J. D. Smedley 161,908
Stove, gas, E. L. Vergurson 161,916
Stove, grate, J. Young 162,136
Stoves, magazine fireplace, S. B. Sexton 162,107, 162,108
Stove pipe shelf, M. H. Harman 161,878
Stove cross piece, cook, W. Stout 162,113
Sugars, refining, F. O. Matthiessen (r) 6,878
Table and slicer, combined, T. Witmer 161,920
Table, ironing, E. J. Wolfrom 162,128
Table slide, extension, J. O. Frost 162,049
Thill coupling, H. A. Luttgens 161,973
Thill coupling, D. W. Thomas 161,913
Tile, ornamental wood flooring, R. Fenn 162,04
Toaster or broiler, wire, Ayres *et al.* (r) 6,871
Toilet caster, S. W. Babbitt 162,006
Tongs, fire, L. Holmes 162,068
Toolhandle fastening, W. M. Fisk 161,942
Toy gun, Shaw & Smith 162,110
Toy gymnast, W. L. Hubbell 161,963
Toy watch, P. Bonfils 162,020
Trap, animal, G. W. Brown 161,859
Trunk fastening, I. W. Valance 161,914
Tuyeres, blacksmith's, V. R. Taylor 161,993
Type case, printer's, L. A. Martin 162,084
Umbrella, W. D. Horton 161,962
Vehicle wheel, E. Hall 161,953
Vehicle wheel, G. Nelson 161,980
Vehicle wheel clamp, D. H. Tuxworth 161,997
Vehicle wheel hub, Rouse & Stoddard 161,904
Vehicles, sled runner for, T. W. Porter 161,985
Velocipede, J. J. Bally 161,924
Ventilator, Stevens & Morse 161,910
Vermin, killing, T. S. Church 161,864
Vessel, marine grain, W. & J. Inglis 162,074
Vise, W. Horton 162,069
Vise, bench, J. M. Poore 161,984
Wagon axle skein, R. I. Azbill 162,005
Wagon brake, W. H. Barrows 162,012
Wagon brake, L. B. Morgan 162,092
Wagon seat, S. Gilzinger 161,915
Washing list, G. Lamb 161,886
Washing machine, J. R. Barnes 161,854
Washing machine, S. J. Morey 161,893
Washing machine, Spangler & Reich 162,112
Watch spring equalizer, C. Hanson 161,957
Water closet valve, G. R. Moore 161,977
Wind wheel, Edwards & Huntoon 161,938
Windmill, J. Hall 162,062
Wire twisting machine, A. De Mestre 162,042
Yoke, horse, Stratton & Olmsted 161,988

DISCLAIMER FILED.

53,429.—Preserving Fruit.—D. Mefford, Norwalk, O.

DESIGNS PATENTED.

8,260, 8,261.—Leather Brush Back.—W. H. Humphrey, Lansingburg, N. Y.
8,262.—Reflector.—C. M. Murch, Cincinnati, O.
8,263, 8,264.—Cassimere.—F. Bosworth, Providence, R. I.
8,265 to 8,268.—Embroidery Patterns.—E. Crisand, New Haven, Conn.
8,269.—Pipe.—A. J. D. Henszey, Ashland, N. J.
8,270, 8,271.—Oil Cloths.—C. Meyer *et al.*, Bergen, N. J.

TRADE MARKS REGISTERED.

2,362.—Mower & Reaper.—Adriance & Co., Poughkeepsie, N. Y.
2,363, 2,364.—Soap.—R. W. Bell & Co., Buffalo, N. Y.
2,365.—Hardware.—Clark & Co., Buffalo, N. Y.
2,366.—Whisky.—A. H. Gillette, Syracuse, N. Y.
2,367.—Paper.—R. J. Harp, New Orleans, La.
2,368.—Bitters.—J. A. Jackson & Co., St. Louis, Mo.
2,369.—Medicines.—E. F. Kunkel, Philadelphia, Pa.
2,370.—Corset Steel.—Lessey *et al.*, Philadelphia, Pa.
2,371 to 2,373.—Whiskies.—T. E. Moore, Shawhan, Ky.
2,374.—Envelopes, etc.—Porter *et al.*, New York city.
2,375.—Medicine.—F. Spreen, Pittsburgh, Pa.
2,376.—Jewelry.—Thayer Jewelry Co., Astoria, N. Y.
2,377, 2,378.—Corsets.—U. S. Corset Co., New York city.
2,379.—Cutlery.—W. Brokhahne, New York city.
2,380.—Medicine.—E. R. Burnham, Chicago, Ill.
2,381, 2,382.—Magnesias.—C. Phillips, 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 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, April 10 to 16, 1875.

4,608.—T. A. Edison, Newark, N. J., U. S. Quadruplex telegraph. April 10, 1875.
4,609.—Wm. Joslevn, Upper Bedford, P. Q. Combined grain separator and fanning mill. April 10, 1875.
4,610.—M. A. Johnson, Rochester, N. Y., U. S. Lamp chimney protector. April 10, 1875.
4,611.—J. H. Weare *et al.*, Cincinnati, O., U. S. Inodorous cooking vessel. April 10, 1875.
4,612.—C. G. Imlay, Philadelphia, Pa., U. S. Fare device for street cars. April 10, 1875.
4,613.—H. Aitken, Falkirk, Scotland. Making illuminating gas. April 10, 1875.
4,614.—P. Charland, Stambridge, P. Q. Movable roof. April 10, 1875.
4,615.—E. Glendillen, Owen Sound, Ont. Force pump. April 10, 1875.
4,616.—C. Clamond, Paris, France. Thermo-electric generator. April 10, 1875.
4,617.—C. Wheeler, Jr., Auburn, N. Y., U. S. Cutting apparatus for harvester. April 10, 1875.
4,618.—P. Schofield, Philadelphia, Pa., U. S. Steam gage cocks. April 10, 1875.
4,619.—J. F. Cole, Sophiasburgh, Ont. Motive power for churns, etc. April 10, 1875.
4,620.—S. E. Griscom, Pottsville, Pa., U. S. Millstone dressing machine. April 10, 1875.
4,621.—W. S. Sampson, New York city, N. Y., U. S. Furnace or kiln with central draft flue. April 10, 1875.
4,622.—C. C. Parker, Aylmer, P. Q. Potato digger. April 10, 1875.
4,623.—E. Bartlett, Renfrew, Ont. Potato digger. April 10, 1875.
4,624.—J. Elliott, London, Ont. Straw and hay cutter. April 10, 1875.
4,625.—J. P. Abbott, Cleveland, O., U. S. Hanging device for eaves troughs, etc. April 10, 1875.
4,626.—J. Cowman *et al.*, Rochester, N. Y., U. S. Artificial marble and ornamental stone. April 10, 1875.
4,627.—J. McKenzie, Kincardine, Ont. Churn. April 10, 1875.
4,628.—Wm. W. Ingraham *et al.*, Chicago, Ill., U. S. Grain scourer and separator. April 16, 1875.
4,629.—J. Mattice, Chinguacousy, Ont. Alternating screw power. April 16, 1875.
4,630.—L. H. Hébert, St. John, P. Q. Cultivator. April 16, 1875.
4,631.—L. H. Hébert, St. John, P. Q. Mowing and reaping machine table. April 16, 1875.
4,632.—D. McCullough, Kemptville, Ont. Axle oiler. April 16, 1875.
4,633.—Wm. Bowes, Pinkerton, Ont. Windmill. April 16, 1875.
4,634.—T. De Witt, Chatham, Ont. Plow coulter. April 16, 1875.
4,635.—James E. Wisner, Friendship, N. Y., U. S. Horse hay rake. April 16, 1875.