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itted with the Miniature Electric Telegraph. By touching title buttons on the desks of the managers signals are sent to persons in the various departments of the establishment. Cheap and effective. Splendid for shops, offices, iwellings. Works for any distance. Price \$6, with good Sattery. F. C. Beach & Co., 246 Canal St., New York, Makers. Send for free illustratea Catalogue.

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lithograph, &c.



A. K. will find a recipe for water glass on 225, vol. 23.-A. F. will find directions for making a sun dial on p. 409, vol. 29.-F. J. C. will find directions for making colored glass on p. 390, vol. 30.-J. N. will find a recipe for blackboard composition on p. 91, vol. 31.-J. N. can utilize the tin of tinned plate scraps by the process described on p. 319, vol. 31.

(1) J. H. asks: How can I make pure chloride of gold and nitrate of silver from United Statesgold coin? A. Dissolve the coin in a limited quantity of a warm (not hot) mixture consisting of one part nitric and three parts hydrochloric acid. When solution is complete, filter from the white residue of chloride of silver: dilute largely with distilled water, and add a filtered aqueous solution of common sulphate of iron (6 parts to 1 of gold); collect the precipitated gold, which is now free from copper; redissolve in aqua regia as at First, and evaporate to dryness on a water bath. Place the filter paper containing the chloride of silver, along with a quantity of borax, in a small Hessian crucible, and heat strongly until the silver is separated and rests as a small button on the bottom of the crucible; remove from the fire, cover, and allow to cool. Then separate the silver from the borax by means of boiling water; dissolve in nitric acid, and evaporate to dryness on a wate bath.

What chemicals will act as a bleaching agent when exposed to sunlight? A. Moisture, chlorine gas, chloride of lime, etc.

(2) M. H. K. asks: What is the green substance that gathers on the outside of a porous earthenware drinking vessel? Does it come from the water inside, or from the atmosphere? It washes off readily, and resembles the green slime of stagnant waters. A. It is probably due to the quantity of organic matter dissolved in the water, which, on evaporating, leaves it behind in the form you mention. Test a little of the clear water by coloring it slightly with permanganate of potash; if, after standing for some time, the color disap pears, the water is unfit for drinking purposes.

(3) S. D. G. says: I have a steam whistle which sounds well at 100 lbs. steam. If I now raise steam to 1,000 lbs. what effect will it have on the whistle? Can it be heard so much farther, or will it fail to sound at all? A. It is problematical whether the expansion of the metal would not altogether alter both the tone and effectiveness of the whistle.

(4) W. M. J. says: The boiler of a thrashing machine engine recently exploded at Lexington. Md. On examination it was found that the safety valve was stuck fast in the guide, it being a light globe valve with a stem about 31/2 inches long. like a common globevalve stem, with thread left off, being a close fit. I am under the impression that the hand had gone once clear around and up to the 65 lbs., as the sheets do not show any signs of having been over heated. A. The safety valve stem being fast totally impaired the efficiency of the boiler, and it is possible that the needle of the pressure gage (if the construction of the gage would permit) had made more than an entire revolution. The pressure in such case is an unknown quantity; hence the explosion.

(5) J. C. asks: Is it possible to plane a piece of hardened steel? A. It is impracticable, and

faction. A. Twist drills 1/4 inch and over in diame ter usually have a taper shank, and a feather on the end which effectually holds them. Those below that size, and those having parallel shanks

may be held sufficiently firm in an ordinary chuck. It would be difficult to make triangular holed chucks run true.

(9) A. C. T. says: I have seen an article in relation to a certain alloy of metals, which when melted was of the required degree of heat for tempering edge tools. What is it? A. We know of no special alloy for that purpose. Common lead is sometimes used, the work being greased before immersion.

(10) L. H. R. asks: 1. I have two shafts situated 24 inches from center. I have an endless belt 66 inches long. How can I find the diameter of two pulleys, both to be the same size, on which this belt will fittight? A. Subtract twice the distance between the centers of the shafts from the length of the belt, and divide the remainder by 3.1416; the quotient will be the required diameter of each pulley. 2. Under similar circumstances the size of one pulley being given, how can I as certain the correct diameter of the second? A. To twice the distance between the centers of the shafts, add half the circumference of the given pulley, and subtract their sum from the length of the belt: the remainder, multiplied by 2 and divided by 3, will give the diameter of the second pulley.

(11) G. D.-It is likely that the law of your State, forbidding the sale of goods manufactured under your patent without a seller's license, may be enforced; but by a number of judicial deci-sions, you are at liberty to travel in any State or Territory and sell rights to manufacture under your patent, and no State legislation can legally stop you.

(12) H. M. says: We are putting up a horicontal engine. Please give us your method of getting out the template, and the lines and right angle line for back box, distance, etc. A. The cylinder and crosshead guides are set true horizontally, and parallel with the bed frame. The crank shaft is set by running a line, true with the bore of the cylinder, the full length of the bed, and setting the crank shaft at a right angle to it, keeping all parts level with a spirit level.

(13) A. M. B. asks: What kind of steel shall I use for making a gun barrel? A. Forge it from a square bar of soft machine steel of not too fine a quality.

(14) J. N. P. asks: What is the rule for calculating the strength of boilers, steam pipes, etc.? A. "For calculating the strength of a singly riveted steam boiler, multiply the internal diameter of the boiler in inches by the pressure of steam in lbs, per square inch, and divide the product by 8.900. The quotient is the proper thickness of the boiler plate in inches."-Bourne.

(15) A. H. D. says: We turn our axle nuts in soda and quinine, and putthem away without cleaning or oiling, and they rust. Is there a way to keep them from rusting without much expense or labor? A. Coat them with boiled oil and white lead, mixed to a thick paint.

(16) C. P. asks: 1. Is the temperature in the hot air space of furnaces, used for heating purposes, enough to make steam? Yes, generally, 2. My house is heated by steam, but not satisfactorily, and I thought of putting in a furnace with a boiler inclosed in the air chamber, believing that should get the heat of the furnace for the lower floors, and make steam enough for the upper stories. Would it work? A. This plan will answer if properly constructed.

(17) J. G. asks: 1. Could I have a brass cylinder, 2x4 inches, made, that would be equal to one half horse power? Yes. 2. Would it be a high pressure engine? A. Yes. 3. Could a small boat be fixed so that the wheel can be propelled with one cylinder? A. Yes.

(18) W. S. S. says: If I place two cylinders, 10x30 inches, side by side, and connect them with a pipe, stop cocks, etc., and attach to the pipe a small engine, cylinder 2x2 inches, and if I fill cylinder No.1 with compressed air, 200 lbs. to the square inch, and cylinder No. 2 is empty, and if the air from No. 1 is liberated through pipe and engine to No. 2, and I keep the pressure to a minimum of 200 lbs. per square inch until all the air is forced into No. 2: What power will I obtain, and how long will it take to empty No. 1 into No. 2, and so on, alternately? A. Yourpower will dependupon the point of cut-off and the speed of the engine, and would gradually decrease, as the air entering cylinder No. 2 would create a constantly increasing back pressure upon the engine which would prevent cylinder No. 1 from ever becoming empty. The time necessary to bring the engine to a standstill in consequence of the above back pressure of course depends upon the size of cylinder No. 1. (19) C. E. K. Jr. asks: For vulcanizing rub ber plates I have a small boiler, 41/2x51/2 inches, which I heat up to 320°. I fill it about 1/4 full of water, and then put in the flask, which makes the boiler about half full. Is all the water converted into steam at a temperature of 320°? If not, what temperature would it take to convert it into steam, and what amount of pressure should I have? A. Only a small portion of the water is converted into steam, and it would not be practicable, with an ordinary apparatus, to evaporate it all in the closed space.

(22) F. M. asks: Please tell me of a remedy for cold feet. A. A fast walk of 21/2 miles, morning and evening, is in most cases a sure cure.

(23) H. L. S. says: 1. I have an engine $1\frac{1}{2}x3$ inches, with a fly wheel 10 inches in diameter. Would it be large enough to run a skiff 10 feet long and 2 feet wide, with a pressure of 40 or 50 lbs. of steam? A. It would be better to use a steam pressure of 100 or 125 lbs. per square inch. 2. What size of boiler would it take? A. Make a boiler with from 20 to 25 square feet of effective heating surface. 3. Could a boiler be made to give that amount of power, using gasoline as fuel? A. Unless you have had experience in the use of gasoline as fuel, it would be better to depend upon coal or charcoal.

(24) H. M. N. asks: Which will be the most conomical way of feeding a boiler, by a steam pump driven by an engine, or by an injector? A. The pump driven by the engine will be the most economical in general, but not the most convenient or desirable in all respects.

(25) W. J. N. says: I have a small boiler 8 inches in diameter and 2 feet long, and propose to enlarge it by having a double shell of $\frac{8}{16}$ iron made, having a water space of 2 inches between the skins. The shell is to be 3 feet high, with an outside diameter of 16 inches, and an inside diameter of 12 inches. Inside of this, I intend to suspend my old boiler, connecting the walls and steam spaces by $\frac{1}{2}$ inch pipes. I will make the lower part of the shell act as a firebox, fitting a door at one side and putting in four cross tubes through the furnace one inch in diameter. Is this a practicable plan? A. If you make the connections so as to secure good circulation, there is no reason why the arrangement will not prove satisfactory

(26) J. W. S. asks: How can I melt German silver? It runs well enough; but when we roli it it is full of scales. A. Do not add the zinc until the copper and nickel are fused together, and put in a little borax with the zinc.

(27) J. B. R. says: Your paper of August 14 contained an article referring to paper suitable for copying purposes. I enclose a sample of an okrapaper, originated by me a few years ago. Until I saw the article referred to above I had never tested my new paper for copying purposes. I think I have reason to be satisfied with the result. You will see that the copying is as distinct as if done with the best Japanese tissue paper; and this has been accomplished with paper that was manufactured for ordinary newspaper printing. The strength of this paper is such as to adapt it for copying important documents, legal papers, etc., while there is no doubt that the paper may be made still heavier (if desired) and yet answer for making distinct copies. Another purpose for which this paper would be well adapted would be in the manufacture of vegetable parchment. A. The paper you send is a fine specimen of exceeding toughness, and is, we think, the strongest unsized paper we have ever seen. It is an admirable copying paper, and would answer well for the purpose you suggest.

(28) F. C. W. asks: What is the best metal for an expansion tube for hot water? A. Copper.

(29) M. R. says: 1. I send a sample of stuff found in a reservoir for condensed steam from an engine. We run steam through 650 feet of pipe (the last 100 feet of which is perpendicular) to a steam pump, the cylinder of which is 8x10. I have found the same material in every spare space between the engine and the pump, making it necessary to clean it out every six months. There has not been any grease in the pipe. I should like to know what it is. A. It resembles the material produced by the action of impure grease on the piston. Examine the piston of your engine and ee whether or not it is changed in places into a charcoal-like substance, that can be readily cut with a knife. 2. I have had a discussion about the distance that water can be raised with a siphon. One claims it could be raised any distance, provided the discharge end was low enough, while I claimed that it could not be raised more than 34 feet. Which is right? A. You are.

(30) M. W.asks: Will you explain in your answers to correspondents how a locomotive will run around a curve, the outside rail of the track on the curve being longer than the inside rail, and the wheels, of the same size, being keyed on the axle at both ends? A. Under the circumstances, the wheels would slide on one of the tracks.

(31) W. P. asks: 1. Is there more pressure on the top side of a boiler than on the lower side. or is there the same pressure upon every square inch in the boiler? A. There is a little more at the bottom. 2. What is the rule for calculating the horse power of an engine? A. See p. 33, vol. 33.

giving alarms, and various other purposes. Can be put in operation by any lad. Includes battery, key, and wires. Neatly packed and sent to all parts of the world on receipt of price. F. C. Beach & Co., 246 Canal St., New York.

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For best Bolt Cutter, at greatly reduced prices address H. B. Brown & Co., New Haven Conn

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Peck's Patent Drop Press. Still the best in use. Address Milo Peck, New Haven Conn

Faught's Patent Round Braided Belting-The Best thing out-Manufactured only by C. W. Arny, 801 & 803 Cherry St., Philadelphia, Pa. Send for Circular. Genuine Concord Arles-Brown, Fisherville, N.H.

would be, if it could be done, disadyantageous.

(6) C. W. M. asks: 1. If I make an engine of brass, it will turn blue when heated. Will the color change if I plate it with nickel? A. No. 2 How large a copper boiler should I have for an engine 11/2x3 inches, and how thick should the shell be? A. Size of boiler about 8 inches diameter and 15 inches long; shell 1/8 inch thick for moderate pressure. 8. Should it be brazed or riveted? A. It should be brazed and riveted. 4. Will ports 1/2x% inches be large enough for a 11/2x3 inch cylinder? A. You will find a rule for size of ports in No. 16, etc., of Practical Mechanism.

(7) W. E. S. says: A friend of mine asserts that, in a common bucket pump the only water lifted by the bucket is that which is above the bucket. Is he right? A. Yes.

(8) A. D. T. says: In my daily experience in the use of twist drills, I have remarked one improvement which a manufacturer might make. It is this: Flatten three sides of the shank; this will do away with all slipping. Also put a good center in the shank. All this can be done at very little expense and cannot fail to give great satis- For welding steel to iron, borax will do.

(20) J. T. says: I send you a piece of scale from a boiler. What is in the water to make such scale, and what will take it off? A. A good feed water heater will probably be efficacious in preventing further deposit; and it is probable that annate of soda will loosen what is already formed.

(21 T. McG. asks: What welding mixture used on vises to weld the faces on the jaws? A.

(32) R. M. says: We want some black paint for smoke stacks that are heated nearly red hot. Is there such a paint? A. We know of nothing that will stand such a temperature.

(33) R. F. H. says: I have a coarse half cound file, 6 inches long, which has been in use for some time. It has become quite strongly magnetized, with the south pole at the tip and the north pole at the tang. Is not this unusual? A. Such an example as you notice is interesting, and not at all usual. Perhaps some of our readers may have observed similar instances.

(34) G. W. I. asks: 1. What practical gain would result from the use of a feathering wheel instead of the ordinary paddle wheel, in the propulsion of steamboats? A. Increase of speed or diminution of power required. 2. Does the float or paddle exert the most force as it enters the wateror as it leaves it? A. There is very little difference.

(35) J. W. W. asks: Will paraffin in nitric and sulphuric acids act the same as nitro-glycerin? A. Paraffin is not suitable for this purpose.

(36) W. A. says, in reply to W. H. P., who asked how a solution of ammonio-sulphate of copper may be rendered colorless and still retain all the copper in solution: Add potassic cyanide. The composition of the solution is altered, but the copper is all there. It may appear dark brown when fresh, but this is due to a little iron in the copper sulphate, and will subside on standing.

(37) M. W. W. says, in answer to the question : Shall we attach a horse to his load at a high point or alow? If the load is light and is to be propelled at considerable speed, it perhaps makes butlittle difference. Possibly it might be advantageous to put it level with the point of draft, as (see your reply to K. C. & Co., No. 40, July 10, 1875) would seem to be your opinion. But if the load is heavy.and the horse will have to exert himself to propelit, it will be, as experience has demonstrated fully, not only advantageous, but frequently absolutely necessary to make the attachment so low that he may have to exert some lifting as well as propelling force; and the rationale of this is that the animal has not weight enough to keep him from pushing his feet backwards instead of pulling his load forward, and he requires to be supplied with it from some other source. I have seen a horse pull a load with a man on his back that he was unab e to move without; and any person who has not tried it will be surprised to see how light a load will stall a team when the attachment is such that it is required to exert some downward pulling force. This consideration is also implicated seriously in the practical operation of tractive engines, and their efficiency would be greatly increased by any device by which the engine could be given the benefitof a portion of the load to hold it to the ground or track, preventing slipping and carrying unnecessary weight.

(38) M. W. W. says, in reply to several inquiries in regard to the draft of high and low wheeled vehicles: A high wheel will be more easily drawn over any small obstruction in the road (such as a stone or stick), or out of a rut, or through mud; but whether this is the case on an ascending grade is a question not easily determined. It has been asserted that a man will draw a heavier load up a given incline on a small wheeled truck than on a large wheeled one, and the theory for it is that a perpendicular line drawn from the center of the axle fails nearer to the point of contact between the wheel and floor; this is equivalent to the short end of a lever, the distance from the axle to the point of contact being the long end. At first this might seem plausible, but an examination of the accompanying engraving will show



that the long ends of the levers, A C, are lengthened or shortened in the same proportion as the short ends, B C, and therefore no advantage is gained by that means. We must, therefore, look for some other explanation, and perhaps the readers of the SCHENTIFIC AMERICAN can clear up the difficulty.

(39) E. D. R. says: If E. B. W. would mix a strong infusion of quassia with his ink, he would have no more trouble with flies eating his inked lines.

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

E. G. A.-No. 1is magnetic oxide of iron. No.2 is probably an alloy of tin and lead; but the sample is too small for a decisive report. No. 3 is a variety of bituminous coal containing considerable percentage of ash.-J. M. B. Jr.-It is a poor variety of porcelain clay.-M. S.-It is a poor pig iron, containing an unusual amount of earthy material.-C. G.-It is quartz, inclosing particles of iron pyrites. It is of no value as an ore.-R. L. -It consists of felspar and calcite, inclosing mica and a few crystals of garnet.-S. G. R.-Itis refined tin. It never occurs native as you found it, and was undoubtedly left there by some person.-J. H.T.-It is a formation of variegated clay upon shale. It has been hardened by exposure .- W. B. H.-No. 1 consists principally of antimony. No. 2 is galena. No. 3 is impure galena. No. 4 is a fine conglomerate.—D. W. W.—To determine the value

[OFFICIAL.]

Scientific American.

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	Faucet, E. Wilson	166,833
	Felting machine, Hooperand Crane	166,699
	Fence, portable. T. L. Davidson	166.687
	File, J. Haptonstall.	166,768
	Flour bolting machine, W. F. Cochrane (r) 6,594, Fork horse hav J. P. Friest	6,595 166 694
	Fuel, apparatus for economizing, L. C. E. Carré.	166,846
	Furnace for brick kilns, W. S. Colwell	166,749
	Furnace for burning edgings, etc I. O. Smith (r)	6,600
ļ	Game board, A. Herzog	166,776
	Garden trellis, I. Goodspeed	166,766
	Gas apparatus, A. Glatchet	166,867
	Gear cutting attachment. W. Krutzsch	100,866
ļ	Generator, steam, J. Goulding	166,768
	Glass cutter, steel, H. H. Clark	166,684
	Grain drill, W. Aldrich	166,729
ļ	Grain drills, force feed apparatus for. W. Aldrich	100.779
	Hair picker, C. A. Teal	166,824
ļ	Hame fastener, S. Spicer	166,902
	Harness saddle tree, A. Teas.	166,907
	Harness trace carrier, E. A. Cooper	166,685
	Harrow, L. Francisco,	166,763
	Hat stiffening machine, G. B. Fuller	166,764
	Heating and ventilating device A H Thorn	100,092
J	und	

	Loom-stopping mechanism, A. S. Wynn	. 166,73	7
	Meat chopper, W. L. Fallis	. 166,865	5
1	Mechanical movement, P. Broadbrooks	. 166,844	1
1	Medical composition, L. Coriman	166 929	\$
1	Metal punching machine. J. R. Lindsay	. 166.707	
	Milling machine. W. Krutzsch	. 166,704	
	Millstone, counterbalancing, H. Klinkermann	. 166,785	1
ł	Mirrors, amalgam silvering for, J. J. E. Lenoir.	. 166,790	
I	Monthead, J. K. Clark	. 166,817	
I	Motion, traverse, C. L. Noe	166,801	I
I	Nail-feeding device, L. A. Dodge	166,857	1
l	Nails, making cut, G. Stacy	. 166.821	I
l	Nozzie, exhaust, white & Levy	166,910	I
l	Nursing bottle. J. J. Christie	166,747	1
l	Ore crusher, wet and dry, H. Bolthoff	166,743	I
l	Packing box, H. N. Hart	166,774	
	Padlock, W. H. Andrews	166,838	L
	Paper stock grinder, U. Abell	166,835	L
	Payement brick. S. Strong	166,822	L
	Photographs, washing, J. L. Cavlor	166.847	L
	Pins to brooches, attaching, C. B. Duesbury	166,754	ŀ
	Pipes, etc., connecting steam, C. C. Walworth	166,735	L
	Plow, W. S. Wadsworth	166,734	Ľ
	Propering mechanism for boats, w. Ascough	166, 786	
	Punches, holding conductors', T. B. Doolittie	166,858	
1	Punching machine, metal, J. R. Lindsay	166,707	1
1	Purifler, middlings, R. W. Gunter	166,770	1
ľ	Radiator, steam, W. B. Snow	166,901	ľ
	Railway rail joint fastening	100,855	
	Rake, horse hay, C. E. Lipe	166,708	ſ
	Refrigerator, beer, J. N. Bohart	166,742	1
	Rope halter, L. C. Chase	166,683	
1	None streicher, C. C. Cartis	166,753	ľ
	Sash holder. S. M. Pratt.	166.808	:
ľ	Saw, cylinder, Peirce & Kinsman	166,718	
	Saw gumming machine, J. M Smith	166,727	1
	Sawing machine, A. T. Nichols	166,887	١.
	Scaffold clamp, W. C. Fellows	166,759	
	Screw cutting die R. C. Nugent	166 716	:
	Separator, grain, W. E. Torley	166,826	
	Separator, sand and gravel, N. J. Keller (r)	6,598	:
	Sewing machine, T. J. Harper	166,869	Ϊ.
	Sewing machine, C. Hodgkins (r)	6,596	1
	Sewing machine corder. W. Wilson (r)	6 603	1
	Sewing machine treadle, R. F. Wilcox (r)	6,602	
	Shade holder, T. Moran	166,884	1
	Sharpening machine, A. S. Weaver	166,830	١.
	Sheep sheers, P. Harlow	166,772	1
	Shingle machine. J. J. Kendall	166.784	
	Shirt, J. W. Hutchinson	166,777	
	Shoe tip or protector, C. T. Grilley	166,789	1
	Shot charger for shot pouches, J. S. Long	166,791	
	Sieve. O. Bond	166,680	1
	Skylight, Querner & Burke	166,390	1
	Soap slabbing machine, J. C. Ralston	166,891	Ι.
ľ	Spader, rotary, W. C. B. Richardson	166,721	ľ
	Spindle bearing surface. E. D. Murfey166.885	166.886	
ľ	Spinning frames, ring for, J. W. Wattles	166,909	
	Stand for water coolers, C. B. Porter	166,889	
	Stave jointing machine, E. & B. Holmes	166,872	
	Stone crushing machine. C. H. Scheermasser	166,807	ľ
	Stove, lamp, M. F. Rathbun	166.892	1
	Stove, oil, H. Allen	166.740	ſ
	Stove, oil, A. Q. Allis	166,738	1
	Sugar, cooling and draining, J. H. Hynson	166,778	
	Table, aujustable rolding, U. S. Hood	166.679	ľ
	Table, ironing, E. C. McClain	166,881	:
	Telegraph key, compound, M. L. M. Hussey	166,876	ſ
	Telegraph, printing, A. Wirsching	166,911	1
	relegraph transmitter, H. Middleton	166 861	
	Thill coupling, S. A. Hathaway	166.697	ľ
	Toy store, E. Durlach	166,755	
	Train stick, J. R. Byer	166,746	
	Irap, animal, E. Oliver.,	166,802	
	Valve, rotary balanced. C. M.Farrar.	166.758	
	Vehicle, fifth wheel, P. B. Cunningham	166,854	1
	Vehicle king bolt, E. Freeman	166,693	ľ
	Venicle lubricating axle, A. Schirck	166.898	
	Vehicle top. J. F. Heger	166.775	
	Vernier, A. Young	166,912	
	Vise, bench, A. Veilleux	166,828	ſ
	Wagon jack, C. T. Drake	166,689	
	Warming annaratue I E Railly	166 804	
	Washing machine, G. W. Holmes	166.871	
	Washing machine, J. H. Mudgett	166,714	
	Washing machine, Palmer & Briggs	166,888	
	Washing machine, O. S. Thayer	166,731	
	Watch, safety pinion. Bacon & Brown	166,741	
	Watch, etc., stem winding, L. Kahn	166,781	
	Watercooler, L. B. Woolfolk	166,736	
	Water wheel Campbell & Johnson	166,889	
	Welding compound. J. Jr. & A.S. Scott.	166.816	l
ſ	Whelehone ate enlitting F F Maniman	166 711	Ľ

CANADIAN PATENTS.

	. 166,844	LIST OF	PATENTS GRANTED IN CANADA
	. 166,853		August 19 to 26, 1875.
	. 166,707	- 000 TI 1	
	. 166,704	5,076H. I chine. A	E. Casgrain, Quebec. Illuminating gas ma- Lugust 19. 1875.
ir.	166,790	5,077E. V	V. Wingard, Pittsburgh, Pa., U. S. Burning
••••	166,817	bricks. 5.078J. H	August 24, 1875. Iewitt. Hamilton City, Pa., U. S. Ore crusher
••••	166,801	and stone	breaker. August 24, 1875.
	166,857	5,079A. 1 feed bag.	Nye. Jr., Boston, Mass., U. S. Telescopic August 24, 1875.
	166,910	5,080J. S	Steger, New York city, U. S. Air brake.
	166,747	August 24 5,081E. J	, 1875. H. Gratiot, Plattsville, Wis., U. S. Wheat
•••	166,743	steamer.	August 24, 1875.
	166,838	peller. A	ugust 24, 1875.
•••	166,835	5,083G. Is	les, Montreal, P. Q. Differential compass.
	166,822	5,094T. Sa	aunders et al., Toronto, Ont. Burglar and
	166,847	fire proof	safe. August 24, 1875. Kelley Athelston P. O. Bolt and rivet.
	166,735	trimmer.	August 24, 1875.
•••	166,734	5,086C. G.	Force, Jr., Cleveland, Ohio, U. S. Device
••••	166,786	5,087W.L	ightfoot et al., Toronto, Ont. Lawn sprink-
••••	166,858	ler. Augu 5.088T. E	1st 24, 1875. I. Marsh. Toronto. Ont. Clamp. August
	166,770	24, 1875.	
••••	166,901	5,089 -E. A and alarm	telegraph. August 24, 1875.
	166,750	5,090W.J	ohnston, Shelby, N. Y., U. S. Door hanger.
•••	166,708	August 24, 5,091J. Ge	arhardt et al., Montreal, P. Q. Portable re-
	166,683	sawing gan	ng saw. August 24, 1875.
•••	166,753	wrench.	August 24, 1875.
	166,808	5,093J. KI	link, Keswick, Ont. Meat-preserving pro-
•••	166,718	cess. Aug 5,034J. J.	Curran et al., Chicago., Ill., U. S. Lum-
	166,887	ber dryer.	August 24, 1875.
••	166,759	1ass for ve	st. Marie, Montreal, P. Q. Screw wind- ssels. August 26, 1875.
	166,716	5,096.—J. J.	Stewart, Sargentville, Me., U. S. Pegging
•••	166,826 6.598	5,097F. V	an Doren, Adrian, Miss., U. S. Corn plant-
	166,869	er. Augu	st 26, 1875.
•••	6,596	August 26,	1875.
	6,603	5,099D. P.	Sharp, Ithaca, N. Y., U. S. Horse rake.
	166,884	5,100J. an	d F. A. Bailey, Farmington, Mass., U. S
•••	166,830	Fruit pick	ler. August 26, 1875.
rk	166,772	August 26	, 1875.
	166,784	5,102J. B.	Fayette, Oswego, N. Y., U. S. Lifting
	166,789	5,103M. a	nd W. Fitzgibbons, Galt, Ont. Washing
•••	166,791	machine.	August 26, 1875.
	166,680	burner. A	Lugust 26, 1875.
•••	166,390	5,105J. C.	Moore et al., Philadelphia, Pa., U. S. Cans g oils, etc. August 26, 1875.
	166,721	5,106N. S	Silverthorn, Toronto, Ont. Hog-cleaning
35	166,870	machine 5,107W. R	August 26, 1875. And erson, Cleveland, Ohio, U. S. Boiler
•••	166,909	flue cleane	r. August 26, 1875.
	166,889	5,108.—S. Ba	gust 26, 1875.
••••	166,702	5,109S. M	itchell, Lima, N. Y., U. S. Carriage hub.
	166,892	5,110J. T.	Burns, Springhill, Ont. Root cutter. Aug-
	166.740	ust 46, 1875	dler. Owen Sound, Ont. Elevator and enow
	166,778	shovel. A	Lugust 26, 1875.
	166,874	5,112J. W	Grover, Westminster, Eng. Spring wash- st 26, 1875.
	166,881	5,113J. H.	Hussey, Baltimore, Md., U. S. Protective
	166,876	toe shoe. 5.114D. M	August 26, 1865. cPherson. Caledonia. N. Y., U. S. Binder.
	166,712	August 26,	, 1875.
50,	166,861	1000 C 1000	
••••	166,755		Advertisements.
	166,802		
•••	166,848	Back P	age
	166,854	Engravings	may head advertisements at the same rate
	166,693	per line, b	ny measurement, as the letter press. Adver-
	166,780	tisements early as F	must be received at publication office as
•••	166,775		
	166,828		ГНЕ
	166,689 166,760		TRADE ENGINE
	100 004	Will I	
••••	100,894		Noiseless in operation Paston
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analysis made.	Heel attaching machine, McKay et al 166,795	Whip socket clasp, E. W. Scott 166.724	v and child. C. P. RICHARDS & CO., Hallowell, Me.
	Heeling machine, Elliott et al 166,756	Wind wheel, H. J. Brimhall, Jr	TOR SALE-Woodward Patent Portable Steam
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HINTS TO CORRESPONDENTS.	Hoisting machine or elevator, E. Schlenker 166,730	Wrench P Samuel 166 814	diameter, pump 834 diameter. in good order, used for
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by mail if the writer's address is given	Knitting machine, weft thread, N. W. Westcott, 166.831	SCHEDULE OF PATENT FEES.	custom, Address S. L. POLLOCK, St. Paul, Minn
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