C. E. H. asks: Is there any way of removing coal tar from the bottom of a sail boat, the boat having collected it by laying in a dock near the gas works? Scraping will not answer. Answer: After scraping off as much tar as practicable, try naphtha as a solvent for the remainder. Rub with a sponge or cloth soaked in the naphtha.

P. asks: What is the best cheap preparation for preserving pine shingle roofs, to be applied either before or after laying the shingles? Answer: The article advertised as slate paint may answer your purpose.

J. B. S. E. asks: Is amorphous phosphorus soluble in any of the ethers? If so, what is the process? If not, what is it soluble in? Will the addition of another substance, not deleterious, make it soluble? Answer: Red or amorphous phosphorus is insoluble in the ordinary solvents of common phosphorus. According to Möhler, red amorphous phosphorus may be rendered colorless and perfectly transparent by fusing it in a concentrated solution of bichromate of potash mixed with sulphuric acid. After this treatment it usually remains liquid after cooling, but solidifies instantly when touched by a solid body.

E. L. says: Suppose four canals, each one mile long and thirty feet wide, to be six feet deep at discharge end, with water below, level with the bottoms. At the entrance ends, the depths are 5, 6, 7 and 8 feet respectively, with full supply of water at these depths, and regular grades between inlet and outlet: How much will each canal discharge in 24 hours? Answer: You can find approximately the velocity of discharge in feet per second, and from this the quantity discharged per second, by the following formula: V = velocity in feet per second, f = total fall in feet, A = cross section of canal in feet, l = length of canal in feet, p = length of wet perimeter in feet. $V = \sqrt{(10{,}000 \times f \times A) \div (l \times p)}$; or the velocity of discharge in feet per second is equal to the square root of the product of 10,000 by the total fall in feet and the area of cross section, divided by the product of the length and wet perimeter.

J. D. W. asks: Does the term steam engine include a boiler, or can an engine be complete without a boiler? I do not refer to portable engines. Answer: A steam engine does not include a boiler unless it is so stated expressly.

P. D. W. asks: What is magilp composed of? Answer: Magilp is a mixture of pale linseed oil and mastic varnish, used by artists as a vehicle for their colors. The proportions vary according to the work. It is thinned with turpentine.

C. M. L. asks: What can I put over silver leaf to keep its color? Answer: Try a varnish composed of pale shellac 8 ozs., rectified spirit, 1 quart; dissolve.

J. W. H. asks: Is it true that, the warmer water is, the more gas it will absorb? I mean any gas that can be absorbed by water. Answer: The general law is that the colder the water, the greater the quantity of the gas taken up and retained by it. Hydrogen is an exception, about the same amount being absorbed at all temperatures of the water.

H. H. M. asks: What is the name of some book that treats of the manufacture of carbolic acid, or how is that article manufactured? Answer: Carbolic acid is made from coal tar. The tar is distilled until anthracene comes over. The resulting oil is rectified, collecting separately the oil which distils over between 302° and 392° Fahr. This oil is mixed with saturated potash ley and powdered hydrate of potash, by which it is converted into a white crystallized mass. This substance is dissolved in hot water; the oil which rises to the surface is removed, and the lower alkaline liquid is neutralized with muriatic acid. Impure carbolic acid now rises to the surface as an oil. This can be purified by washing with a little water, digesting over chloride of calcium to dry it, rectifying several times, and finally cooling to 14° Fahr., when pure crystals of carbolic acid separate, from which the remaining fluid portion is poured off. We know of no treatise on the subject.

H. C. L. asks: Will a register placed in a wall six feet from the floor heat a room as quickly and as cheaply as one placed fifteen inches or less from the floor, and why? Answer: Yes: for whether the register is placed near the ceiling or the floor, the warm air will ascend to the former at once, unless some obstruction intervenes. Where a lower hall way connects with an upper one by stairs, and the register is in the lower hall, the warm air will not ascend to the upper one, because of the obstruction of the ceiling and the attraction of aggregation which subsists between the particles of the warm air; but in an ordinary rectangular room such obstruction does not exist. The proper place for a register for warm air, however, is at or near the floor, for convenience in warming the feet, etc., in very cold weather. All rooms intended to be warmed by the ingress of warm air should have a ventilation flue, having a register at the bottom and at the top of the room, to insure a proper inflowing of the warm air, and this flue should be on the opposite side of the room from the warm air flue.

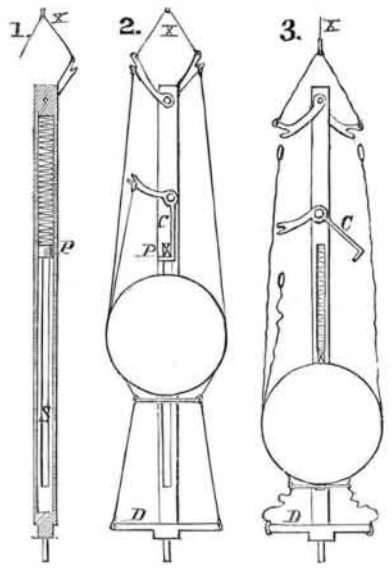
C. A. H. asks: By connecting a 2 inch hose to a 2½ inch, is there anything gained? Is it better than all 2 inch? Answer: The friction of the water will be decreased by this arrangement, and the pressure in the large hose will be the least.

K. asks: Is a mining lamp as safe if enclosed in finely perforated brass as in wire cloth? Answer: Yes.

E. C. G. asks: 1. Is there any way of replacing the gilt on a frame, and what is it? 2. How can I galvanize wrought iron? Answers: 1. You could scarcely do this work, if you have had no practical experience in the matter. We would advise you to entrust it to some one who makes a specialty of this kind of business. 2. Dip the iron into muriate of zinc, and afterwards into molten tin.

R. A. P. asks: What is the formula for ascertaining the proper hight and diameter of a marine engine smoke pipe, as used by successful engine builders? Answer: The practice of different builders varies greatly, and the best rule would probably be an empirical one based on data obtained from successful examples. For an approximate rule, the following is a very good one: Allow 200 cubic feet of air for the combustion of one pound of coal per minute; and having assumed a diameter for the chimney, and the number of pounds of coal to be burnt per hour, it will be easy to ascertain the amount of air required per hour, and the consequent velocity in feet per second. Then for a temperature of gas in the chimney, from 450° to 500° Fahrenheit, the hight of the chimney in feet necessary to produce this velocity is equal to one eighteenth of the square of the velocity in feet per second. More accurate methods are given in Professor Rankine's "Treatise on the Steam Engine and Other Prime Movers."

J. S. says, in reply to T. H., who asked if a spar of white pine could be used as a float for deep sea soundings: At the depth he mentions, namely, 5,000 fathoms, I am almost certain his spar, once down, would never rise again, for the following reasons: Dry wood is principally composed of cellulose, the specific gravity of which varies from 1·25 to 1·5; and were it not for the cellular structure of wood, it would not float at all, as is practically shown when it becomes water-logged. At a depth of 5,000 fathoms the pressure would be about 15,000 lbs. to the square inch, or 1,080 tuns to the square foot. I do not think white pine could resist such an enormous pressure. The use of a mixture to generate gas at the bottom of the sea is not impossible, but should say it is highly impracticable. Sea water is about 850 times heavier than atmospheric air; but at a depth of 5,000 fathoms, air would be compressed 1,000 times, and therefore would become heavier than water. Any gas of a greater density than air, such as carbonic acid, is of course out of the question. Hydrogen is the only gas that could be used. 1,000 cubic inches of hydrogen, at 60° Fahr. and barometer 30 inches, weigh 21·379 grains; at the above depth 1000 cubic inches would be compressed to 1 cubic inch. The weight of 1 cubic inch of sea water is 258·264 grains. Consequently 1,000 cubic inches of hydrogen would have a lifting power (at the above depth) of about 237 grains; or to lift 10 lbs., as T. H. wants to do, it would require 170 cubic feet of hydrogen. This scarcely requires comment. T. H. could easily accomplish his object by using as a float a flexible waterproof bag containing some liquid lighter than water, say a hydrocarbon oil of specific gravity 0·7. A cylindrical bag, 6 inches diameter and 2 feet long, thus filled, would have a lifting power in sea water of about 3 lbs. All liquids being nearly alike compressible, the difference of buoyancy between the bottom and the surface



would be very minute. As the deposit at the bottom of the sea is in some places, I believe, of a tenacious nature, T. H.'s sounding rod might possibly stick there, unless his float was inconveniently large. It might be advisable for him to provide for such a contingency by using the apparatus represented by the engraving. Fig. 1 is a tube with a slot, S, on either side, containing a loosely fitting piston, P, with two lugs projecting through the slots, also a strong spiral spring. Fig. 2 shows the spring held compressed by a catch, C. Fig. 3 shows weight and catch disengaged; the lugs of the piston, striking the weight, jerk the tube clear of everything. The disk, D, prevents the possibility of end of tube sinking in the bottom, without disengaging the weight. The float is attached at X.

A. T. A. says, in reply to G., who is troubled with red ants in his sugar: My sugar bucket contains about twenty-five pounds of sugar, and I am frequently troubled with these same red ants; but when so troubled I get three or four large black ants and put them in the bucket; and in less than three hours, not a red ant is to be seen, the black ones eating them up. As a means of preventing ants from getting on to a table, I put a piece of tobacco under each of the feet, and keep the table from contact with anything else.

R. S. H. says, in reply to C. F. B., who says that filing hand saws towards the point leaves more bevel on the front or cutting side of the tooth than on the back side: This is correct. He further says that the difference in the bevel is caused by the taper of the file. In this, I think, he is not correct. The difference of bevel on the two opposite sides of the tooth is caused by the position in which the file is held. If he runs his file level, while the saw is held plumb, he will find the bevel so nearly alike on the two sides that it will be difficult to decide which side has the most, showing that the taper of the file has little or nothing to do with it. Dropping the handle end of the file and elevating the point will and does produce the effect which he lays to the shape of the file. Moreover it produces a deeper cut, and a longer and more pointed tooth, which gives a sharper cutting point, and furnishes more space in which to carry the sawdust.

S. S. says, in reply to F. A. S., who asked for directions for constructing a stove to dry fruit, etc., without changing the color: He should have the dryer made of brick, or, if it is made of iron, have it fitted with a porous lining, and never allow the heat to get below 100° as the color changes in proportion to the time it takes to dry the fruit. If he intends to dry large quantities, it should be made with several chambers, that the green fruit may not be put in with that which is partially dry.

A. H. says, in reply to J. C. S., who asked about the dimensions of a belt per horse power: A 1 inch belt at a velocity of 750 feet per minute is a perfectly safe rule to calculate for one horse power. [There seems to be a considerable difference in the figures used for belting, and we shall be glad to hear from any of our readers who have made experiments. A rule by Mr. Rider, lately published, states that a belt one inch wide, and bearing on at least one third of the circumference of the smaller pulley, will transmit a force of 19·25 pounds, at any velocity. Applying this rule to the present case, we find that, with a velocity of 750 feet per minute, the belt would transmit (19·25×750) ÷ 33,000 = 0·431 horse power.—EDS.]

T. M. G. says, in answer to a querist who asked if broken files can be mended: I have to say that my father once imported a lot of files, many of which arrived broken. He tinned them on the clean broken ends and "sweated" them together. In order to test the strength of the joint so made, one was struck across something, and the file broke within an inch of the joint.

D. R. says, in reply to a correspondent who asked how to harden jewellers' rollers: Put them in a cast iron box with carbon made from ivory chips, and keep the box at a dull red heat for 4 or 6 hours; then dip the rolls in water, or salt and water. They must be handled quickly from the box to the water, as the air spoils the surface.

A. S. G. replies to R. B.'s query as to passing trains as follows: Engine A can run on to the siding with eight cars, leaving the other eight on main track. Engine B then runs past, pushing the eight cars before it, after which A regains its place on the main track, getting out of the way while B puts the eight cars on to the siding, runs by them, and pulls them again on to the main track. The trains have now passed, and nothing remains but for A to pick up its cars, and go on its way. No problem of this kind is insoluble, as long as the siding can hold at least one car with its engine. [Answers similarly correct have been received from F. D. C., E. L. W., T. M. W., G. E. K., H. R. R., H. C. B., S. B. E., F. V. F., J. J. M., J. T., L. B. E. L., F. A. W., O. B. A. S., E. R. and J. N. P.—Eds.]

B. B. says, in reply to R. B.'s query as to trains passing each other: Two trains cannot pass each other under the circumstances described.

J. S. B. & Co. say, in answer to H. H. who asked for a cement for a leaky cast iron furnace: Clean borings or turnings of cast iron 1 lb., sal ammoniac, 2 ozs., flowers of sulphur, 1 oz. Mix them well together and keep dry. When required for use, take of the mixture 1 part, clean borings 20 parts: mix thoroughly and add a sufficient quantity of water. A little grindstone dust added improves the cement.

A. D. N. replies to A. P., who is troubled with water in his boiler: I guess you have no drain cocks to your cylinder or steam pipes, and that the water which troubles you is condensed steam collected in your engine while cooling off. Any engine is harder to start after cooling, partly because of the water of condensation and partly because the engine is cold. [A. P. says that when he uses a small quantity of water in his boiler, he does not have the trouble; hence it does not probably occur from condensation in the cylinders only.—EDS.]

D. B. says (in answer to A. B. F. who asks: 1. Does sulphur when burned for bleaching purposes do equally well whether the flame is blue or red with a sparkling blaze? 2. Does the burning in the two different ways produce same kind of gas? 3. What will prevent cotton or linen fabrics from becoming mildewed?) 1. The flame of sulphur is blue; the red blaze must be produced by some impurity. 2. The blue, of course, gives rise to the bleaching property. 3. Mildew can be prevented by the use of powdered sulphur.

G. W. W. says, in reply to E., who asked how to utilize several hundred horse power running to waste at a distance of 3 miles: Put a water wheel at the fall, and attach air pumps, lay a pipe from the pumps to the factory, of suitable size, then connect to your engine the same as with steam. Start your pumps and compress the air in your pipes, and with it run your engine, without steam, fuel or boiler. You will have no danger from fire or explosion. A safety valve can be placed on your main pipe to carry off surplus pressure. Power can be let all along the line of pipe, and it can be conveyed any distance.

J. H. W. says, in reply to A. K., who asked for a recipe for invisible ink: The following recipe is a good one: No. 1. 1 dram sulphate of copper or of iron, 1 oz. water; put into a bottle. No. 2. 1 dram prussiate of potash, 1 oz. water; put into another bottle. Write with No. 1, using a gold or quill pen. When dry, apply No. 2 with a feather, or lay a wet cloth saturated with the fluid on the writing, when it will be perfectly visible. The writing will be of a dark blue color. This is called invisible ink.

J. H. W. says, in answer to W. B., who asked how to remove ink spots: Use cyanuret of potash or oxalic acid. After the removal of the spots, wash well with water; and if the color of the cloth is taken out, apply ammonia, when it will be instantly restored.

C. H. A. says, in answer to G., who asked how to get ants out of sugar: Every ant in it will, sooner or later, go home with a load, and then return for more. Hence, if the vessel containing sugar or other substance infested by ants be removed from the place where it stood to another, the ants in it will take their loads and depart. Those returning will be like an Irish friend of mine, who, seeking a foot bridge which had once been laid across a stream, exclaimed: "Here it is, an' 'tis gone, sure!" The very last ant will leave in the course of a few hours, but it may be necessary to move the package several times, to prevent those which have found their way home from returning with their friends. I have tried this repeatedly and it has never failed.

G. W. F. says: E., in a recent question, says: "I have several hundred horse power running to waste," etc. It seems to me to be a problem, well worthy of the most serious consideration, how to make the most of water power, particularly where it exists, as your querist states, to the extent of several hundred horse power. The most perfect key to this matter, conceivable, seems to be that mentioned in your last issue as practiced in Belgium, namely, the transmission of power by means of compressed air. The letting of excess power to run any body's factory readily suggests itself, or even its application for the manufacture of ice.

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

R. J. says: 1. I send a specimen which completely puzzles me. Recently I had given to me several very rich specimens of gold ore. I extracted the gold by pouring on it 1½ parts of hydrochloric acid to one part of nitric. My object in putting in a larger quantity of hydrochloric than nitric was to precipitate the silver which was in the ore. I left them together until all effervescence ceased; I then had an orange colored liquid, which I evaporated until it got gummy; this I put into a crucible and heated to a white heat, and the specimen here with was the result. 2. What is the best work on chemistry? Answers: 1. We are afraid that you have been deceived in the appearance of the ore which you imagined contained so much gold. The residue sent us consists largely of the red oxide of iron; and from your account, there is little doubt that you have been trying to extract gold from the bright yellow sulphide of iron, or iron pyrites. The effervescence was caused by the decomposition of the nitric acid, nitrous fumes being evolved. The sulphur was oxidized by the nitric acid into sulphuric acid, which combined with the iron oxide to form sulphate of iron, some sulphur being separated. It was this sulphur which caused the liquid to become gummy when evaporated and heated. The hydrochloric acid, in the presence of the oxidizing nitric, played a minor part. The solution finally contained sulphate of iron, free sulphur, free hydrochloric acid, and perhaps some chloride of iron. The white heat, to which the solution (evaporated to dryness) was finally submitted, decomposed the sulphate of iron, driving off the acids or decomposing them, and there was finally left the red oxide of iron. There may have been some grains of metallic gold, however, as there generally is in iron pyrites, though seldom enough to pay for extraction. The gold can be extracted by the following method: The pyrites is roasted as thoroughly as possible to drive off the sulphur. It is then reduced to powder and agitated with mercury. The mercury combines with the gold present, forming an amalgam of mercury and gold. This amalgam is then submitted to the action of heat, by which the mercury is driven off and the gold recovered in the metallic state. The mercurial vapor is of course condensed, and the metal used for another operation. 2. Bloxam's is highly recommended.

E. B. G.—The stone you send is a hard fine grained limestone, and looks as if it might be available for lithographic purposes, but the specimen is too small for us to judge accurately of its value. A good lithographic stone is of a yellowish gray color, and uniform throughout; free from veins, fibers and spots; a steel point makes an impression on it with difficulty, and the splinters broken off by the hammer have a conchoidal fracture.

E. L. W.—Your specimen is rich in lead, and is probably a lead ocher; but it is too small for complete analysis.

COMMUNICATIONS RECEIVED.

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

On Crank Pins. By W. A. S.
On a Balloon Experiment. By D.
On Pressure and Space. By J. A.
On Air and Steam Engines. By F. A. W.
On Perpetual Motion. By J. W. S.
On Traction Engines. By H. M. S.
On the Art of Inventing. By J. E. E.
On Street Pavements. By W. H. B.

Also enquiries from the following:

E. G. de W. & Co.—J. S. B.—D. M.—C. W.—J. J. H.—C. & N.—G. C. F. S,

Correspondents who write to ask the address of certain manufacturers, or where specified articles are to be had, also those having goods for sale, or who want to find partners, should send with their communications an amount sufficient to cover the cost of publication under the head of "Business and Personal," which is specially devoted to such enquiries.

Correspondents in different parts of the country ask: Where can I obtain pipe clay for making lead pencils? Who owns the patent rights for the various artificial stones? Who makes the best candle machine? Does the vapor stove, using crude petroleum, work well practically? Who recently invented a process for tempering and preserving the elasticity of steel and brass springs? Makers of the above articles will probably promote their interests by advertising, in reply, in the SCIENTIFIC AMERICAN.

[OFFICIAL.]

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Letters Patent of the United States

WERE GRANTED FOR THE WEEK ENDING

September 9, 1873,

AND EACH BEARING THAT DATE.

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Roof, metallic, I. S. Mettler	142,641
Sad irons, etc., varnishing, W. J. Reagan	142,728
Sandpapering machine, H. L. Hapgood	142,626
Sash balance, L. S. Wright	142,604
Sash fastener, L. L. Bates	142,667
Saw filing and setting machine, N. G. Ross	142,585
Saw table, circular, H. C. Rosin	142,733
Saws, gage for gang, N. C. Moody	142,643
Sawing machine, E. Inman	142,699
Sawing machine, spoke, J. L. Thralls	142,749
Screw blanks, machine for threading, E. Croft	142,560
Separator, grain, J. W. Breese	142,672
Sewer basin for street corners, J. H. Boschen	142,671
Sewing machine caster, E. R. Clark	142,615
Sewing machine hemmer, J. D. V. Eldredge	142,689
Sewing machine table lock, J. B. Logan	142,780
Sewing machine treadle, M. H. Knapp	142,704
Sewing machines, motor for, R. H. Atwell	142,551
Shoes, manufacture of, C. W. Green	142,691, 142,692
Shook holder, J. I. Berry	142,553
Shutter, fireproof, A. Gottlieb	142,563
Shuttle box mechanism, J. Schrack	142,736
Skirts, etc., ornamenting felt, J. W. Blackham	142,554
Sled brake, P. Gable	142,623
Spray jet, adjustable, A. Nickerson	142,719
Square, try, W. H. Cooper	142,557
Stamp, fountain hand, F. J. Coutant	142,617
Staples, machine for making, W. Malick	142,574
Stove, heating, Little & Nation	142,707
Stove pipe for vessels, J. Hall	142,567
Stove, reservoir cooking, D. H. Nation	142,717
Stove oven attachment, Craine *et al*	142,558
Straw cutter, R. A. Rash	142,726
Table, extension, J. M. Sackman	142,586
Table, ironing, A. J. Palmberg	142,645
Tallow, etc., cooling, A. Smith	142,744
Thrashing power, traveling, R. W. Faris	142,621
Tile machine, C. J. Merrill	142,576
Tobacco ridger, J. R. Whittemore	142,753
Tool handle, W. B. Hill	142,568
Trap, stench, J. Semple	142,739
Trunks, etc., strap fastening for, W. Grinsted	142,565
Type, arranging, D. B. Ray	142,652
Tyre setter, J. Palica (r)	5,565
Tyre tightener, M. E. Jacobs	142,633
Valve, main stop, C. W. Isbell	142,700
Valve, steam, H. P. Jones	142,702
Vegetable cutter, G. W. Parker	142,580
Veneers, cutting, J. A. Squires	142,591
Ventilating building, L. B. Valk	142,598
Vessels, center board for, J. Call	142,677
Vessels, relieving grounded, W. R. Righton	142,732
Wagon brake, W. F. Osborn	142,579
Wagons, end gate for, F. Grundy	142,566
Washing machine, S. Budlong	142,676
Washing machine, C. W. Sherer	142,742
Watch case latch, J. C. Dueber	142,684
Water cooler and filter, combined, W. J. English	142,620
Water filter, J. Pearson	142,722
Water meter, T. T. Prosser	142,650
Water strainer, F. W. Mase	142,711
Water wheel, turbine, A. A. Herriman	142,628
Wind mill, O. B. Knapp	142,636
Window screen, J. F. Scherpe	142,735
Wood rails, machine for dressing, H. G. Angle	142,608
Wool drying frame, E. Duffee	142,561
Wrecking apparatus, McGroder & Tiedemann	142,712
Wrench, W. J. Innis	142,570

APPLICATIONS FOR EXTENSIONS.

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

26,454.—RAILWAY SWITCH.—W. Wharton, Jr. Nov. 26.
26,484.—PLATFORM SCALE.—T. Fairbanks. December 3.
26,486.—PIPE MOLDING.—J. Ferth *et al*. December 3.
26,513.—NAIL PLATE FEEDER.—J. Newell. December 3.

EXTENSIONS GRANTED.

15,861.—NUT MAKING MACHINE.—W. E. Ward.
25,434.—COTTON SCRAPER.—J. H. Mitchell.
25,395.—BOOT HEEL.—S. Dodge, Jr., *et al*.
25,442.—PORTABLE FURNACE, ETC.—D. R. Prindle.
25,473.—SCALE.—A. Turnbull.

DISCLAIMER.

24,442.—PORTABLE FURNACE, ETC.—D. R. Prindle.

DESIGNS PATENTED.

6,874.—SAD IRON HANDLE.—J. Hargrave, Cincinnati, Ohio.
6,875.—CHAIRS.—G. M. Harwood, Troy, N. Y., *et al*.
6,876.—LAMP STAND.—W. H. Perkins, Meriden, Conn.
6,877.—FIRE PLACE STOVE.—S. B. Sexton, Baltimore, Md.
6,878, 6,879.—INKSTANDS.—B. Brower, New York city.
6,880.—RUCHE HOLDER.—D. Kisch, New York city.
6,881.—MONUMENT.—M. Van B. Mitchell, Zanesville, Ohio.

TRADE MARKS REGISTERED.

1,442.—LICORICE PASTE.—D. V. Arguimbau, Brooklyn, N. Y.
1,443.—WHISKY.—Derby & Day, St. Louis, Mo..
1,444.—WATCH CASE.—J. C. Dueber, Cincinnati, Ohio.
1,445.—HAT.—J. S. Fayerweather & Co., Danbury, Conn.
1,446.—MEDICINE.—Fenton Manuf. Co., Cleveland, Ohio.
1,447.—SEEDS.—D. M. Ferry & Co., Detroit, Mich.
1,448.—WHISKY.—W. M. Fliess & Co., New York city.
1,449.—HOSIERY.—Smyth & Co., Balbriggan, Ireland.
1,450.—GOLD RINGS.—Dueber Watch Case Co., Cinn., O.

SCHEDULE OF PATENT FEES:

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