C. T. asks: How can I clarify beer? A. Take isinglass, finely shredded, 1 lb, sour beer, cider, or vinegar 3 or 4 pints; macerate together till the isinglass swells, and add more of the sour liquid until a gallon has been used. Strain and further dilute. A pound of good isinglass should make 12 gallons finings, and 1½ pints finings is enough to clear a barrel of beer.

W. N. J. says: A certain philosopher states that "the moon has either no atmosphere at all, or one exceedingly rare, and not extending more than a mile from its surface. Hence it must be destitute of water, for any liquid on its surface would long since have been dissipated by the heat of the lunar days, there being no atmospheric pressure to check evaporation. If there were any water on the surface of the moon, clouds would certainly be observed at times dimming its face." 1. I ask for information through the SCIENTIFIC AMERICAN. Supposing water in the shape of lakes to exist on the surface of the moon, how could evaporation take place, and clouds float, to dim the moon's surface, if there were not an atmosphere having a certain pressure through which vapor could rise and form clouds? A. The elastic force of a vapor which saturates a space containing air or gas is the same as in a vacuum. 2. Does evaporation check by atmospheric pressure, or does this pressure assist evaporation? If the moon has no atmosphere, and water exists to a considerable amount, it would certainly not be dissipated, but heaped up mountain high by the expansion of particles during a day of three hundred hours of intense solar heat, and then subside again during the following long night, and of course escape detection by the closest observers. A. The rapidity of evaporation is inversely as the pressure upon the surface of the evaporating liquid, that is, pressure diminishes evaporation.

P. R.—B.'s cheap telescope, described in No. 1, vol. 30 of the SCIENTIFIC AMERICAN, is an interesting experiment. You had better buy an achromatic objective, if you can afford it; if not, save your eyesight and money.

F. asks: 1. Of what diameter ought a double acting force pump to be for a 2 inch supply pipe? A. Four inches. 2. Should the discharge pipe be of the same diameter as the supply pipe? A. Yes. 3. Must the air chamber of a pump stand upright if the pump be placed at an angle? A. Yes.

E. P. F. asks: 1. If a globe made of sheet metal, 10 feet in diameter, weighs when full of air 1,000 lbs, how much less would it weigh after exhausting the air so to form a perfect vacuum? A. About 40 lbs. 2. What outside pressure would it have to sustain after the air was exhausted? A. 14·7 lbs. per square inch of surface, or about 650,000 lbs. in all.

L. D. says: 1. The balls we have been using in a ball mill are of cast iron, and weigh on an average 2½ lbs. each, diameter being 5⅝ inches. What should be the weight of a solid ball of cast iron of that size? A. About 21 lbs. 2. Is there any difference in the weights of steel and cast iron balls of the same dimensions? A. The steel ball would be about 2 lbs. heavier. 3. Is a life of Robert Fulton published in the United States? A. There are several works on this subject. See our advertising columns for booksellers' addresses.

S. R. asks: How can I cut window glass to an oval shape? I have a glass cutter, but find it will not cut without several failures, breaking plenty of glass. A. Use a good diamond.

D. asks: What will be the volume of steam at atmospheric pressure, evolved in the conversion of any given volume of water, and what the volume of oxygen and hydrogen at same pressure, evolved in the decomposition of the same quantity of water? A. Supposing that a cubic foot of distilled water at 212° Fah. is converted into steam, and also decomposed into its constituent gases at the same temperature: The volume of the steam formed from this water will be 1,572 cubic feet; the volume of oxygen, 813 cubic feet; the volume of hydrogen, 1,621 feet.

J. E. asks: I saw in your journal a description of a wonder camera; and I have been endeavoring to make one, using an opera glass objective of about 7 inches focus and 1¾ inches diameter for a lens, and an argand gas burner. It will throw upon the screen an ordinary card photograph of about 3 feet high pretty fairly, but the image is not distinct enough. What kind of lens and of what size and focus should I use to obtain the best results with an argand gas burner? Will such a burner give light enough, with a proper lens, to make a clear, distinct picture on the screen 5 feet in high? A. Lantern objectives and condensing lenses are described in back numbers of the SCIENTIFIC AMERICAN. Place a number of burners in a straight line, one behind the other, as flame is nearly transparent.

S. N. M. asks: What astronomers have observed any solar eruptions, having an upward velocity of 600 miles a second? When were such observations made? I suppose that 166 miles a second (Professor C. A. Young's statement) is the greatest observed velocity. A. The observations of Professor C. A. Young, September 7, 1871, indicate more than this velocity. At each explosion we see an eruption of hydrogen. Masses of other metals may precede or accompany it, in a semi-liquid or gaseous condition. They are not seen in the spectroscope while we look at one of the hydogen lines with a wide slit.

A. F. C. says: I have a 3 inch achromatic telescope of 48 inches focus; and with the Huygbenian eyepiece I get a power of about 120. How high a power will it stand, and how must I construct the eyepiece? A. Probably 200. Then 48 inches ÷ 200 = 0·24 inch = equivalent focus of eyepiece. Focus of field lens will be twice this, or 0·48 inch. Focus of eye lens will be one third of focus of field lens, or 0·16 inch, and the two plano-convex lenses will be 0·48 − 0·16 = 0·32 inch apart.

I. G. W. asks: 1. I have an achromatic object glass 2 inches in diameter and 36 inches focus. Of what focus and what distance apart should the eye lenses be to obtain the strongest power compatible with distinct vision for a celestial eyepiece? A. Field lens, of three fifths of an inch focus. Eye lens, one fifth of an inch focus. Distance apart, two fifths of an inch. Equivalent focus, three tenths of an inch. Power, 120. 2. What additional lenses, and what distance apart would it be necessary to add to make a terrestrial eyepiece? A. Two Huygbenian eyepieces make a good terrestrial one. The lowest power is placed about twice the sum of the equivalent foci of the two eyepieces in front of the other. 3. In your answer to N. B in your issue of May 9, you mention the two eye lenses as being respectively ¼ and ⅛ inch focus, and the ⅛ in its own focal distance within the focus of the other, and further say they will be ⅛ inch apart. Is this an error, or should the measurement be from the glass instead of the focus? A. In our reply to N. B. May 9, we should have written "eye lens, ¼ inch focus," as is evident from the context.

A. P. W. asks: 1. Can the vapors of coal oil be condensed by cold water? A. The vapors of coal oil can be condensed by passing them through a tube surrounded by cold water. 2. What kinds of gases are used in gas engines? A. Common illuminating gas mixed with air has been used in gas engines. The mixture is ignited by an electric spark. Some of the hydrogen formed by the ignition united with oxygen of the air, forming water; this produces heat, which expands the gases and drives a piston.

W. M. B. says: I want to paint a disk, 2 feet in diameter, with the seven prismatic colors, in such a manner as to make the surface appear white when I revolve it fast. What proportion of each color must I use? How shall I divide the disk in a proper manner? A. Divide the circumference of your disk into 6 equal parts. Then draw radial lines from the center to each of the 6 points. In the center of the disk, paint a round black spot about 3 or 4 inches in diameter; also paint a narrow black rim on the edge of the disk. In each of the six spaces formed by the radial line, paint the seven prismatic colors; you will thus have six spectra. In a spectrum, the orange occupies the least extent; if, therefore, you make this the unit, the extent occupied by the colors will have the following relation: Violet 4·16, indigo 2·40, blue 2·50, green 2·87, yellow 1·08, orange 1·00, red 3·33.

D. I. F. asks: 1. What is best to kill the effects of nitric acid on the teeth, so as not to hurt the enamel? I have been using said acid on my tongue. A. When the enamel is gone, the dentine is rapidly affected by the secretions of the mouth, especially when the system is not in a healthy condition. Soda is too powerful in its alkaline reaction. Repeated gentle rubbing with a soft brush and a harmless dentrifrice like precipitated chalk would be better. 2. How can I detect cider which is not made from apples? A. If you suspect that it is made from oil of vitriol, the latter may be detected, with proper precautions, by chloride of barium.

B. M. K. Jr. says: 1. I constructed a telescope according to the plan given on p. 7, vol. 30, of the SCIENTIFIC AMERICAN. For the object glass I have a meniscus of elliptical form, 1½ by 1⅝ inches in diameter and 3½ feet in focus. The eye glass is a plano-convex lens of 1½ inches in diameter and 1 inch in focus. So far I have failed to produce a perfect object. There is a great deal of prismatic color, and the rays of light seem to produce different foci. What do you think is the matter? A. An elliptical lens cannot be properly figured; besides, your objective is not achromatic. 2. As the hole in the tube is circular, does it make any difference of what form the object lens is? A. A diaphragm which cuts off any part of the aperture of an object glass reduces the amount of light passing through it. 3. Can you tell me how to polish a lens that has become scratched? A. To polish a lens, turn a wooden disk with a broad bandle to the proper curvature; paint the disk with a mixture of pitch and rosin just dented by the thumb nail when cool. Cut grooves across the pitch, dividing it into one inch squares with diagonal grooves across the squares. Warm, and press quickly on the lens with a piece of paper between them. Wash off adhering paper if necessary. Then coat with moist rouge and rub the lens with hypocycloidal polishing strokes while walking round it. Five minutes rubbing will suffice to destroy the figure of any object glass. Herr Steinheil showed us a scratch on a two inch lens which he said would take the workman half an hour to polish out. 4. Will the so-called furniture polish spoil the varnish on a piano forte? A. No.

C. K. asks: 1. Of what could I make a box, to keep matches on a sheet iron mantle from catching fire? A. Of some poor conductor, such as china, porcelain, glass, plaster of Paris, etc. 2. What is the specific gravity of a piece of elmwood weighing 2 ounces, with a piece of lead attached to it weighing 4 ounces, and how can I find the specific gravity? A. The specific gravity of your piece of elmwood can be found by the following equation: Specific gravity $= \frac{2}{6+(x+36)}$, where x equals the sum of the weights of the wood and lead in water. 3. Why is it that some lenses show objects upside down? A. Because their action on light is to bring its rays to a focal point where they cross each other, and for this reason the image appears inverted. 4. How can I make a good battery? A. See p. 379, vol. 30.

S. T. asks: How can I bore a journal box to fit a V-shaped journal, and have it quite true, so that it will be exactly the same angle in each half of the box, and one angle true with the other? Are there any special machines for such purposes? Having only a compound rest lathe, the box must be chucked twice, and cannot be set quite true. A. There are no special tools for such a purpose, but your lathe will answer the purpose by the following method: Set the head of the compound rest to the required angle and bore out the front end of the journal box. Then cross the belt of the lathe so that it will run backwards. Use a tool bent round to the right and bore the back half of the box from the right hand side of the box (that is, the opposite side from which the front end was bored), by which method of procedure the box will only require one chucking and is certain to be quite true. Another method is to turn the tool upside down without crossing the lathe belt, and turn the back end of the box from the right hand side as before, but this renders the tool more liable to spring and jar; the first method is therefore preferable, but the rest requires in either case no alteration of its angle to perform the duty on both angles.

H. P. says: I have a cedar tank for rain water for washing purposes, and the water is foul, smelling principally of cedar, mixed with stale or stagnant smells. What shall I do to renovate it? A. We have seen the following recommended: Sprinkle a tablespoonful of powdered alum in a hogshead of water stirring the water at the same time, then let the water stand for a few hours. If, upon trial, this should not be satisfactory, let us know what results you do obtain, and a method suited to the requirements of this case will be recommended.

J. A. asks: Can you tell me of any preparation (except bismuth and rose water) that can be used for whitening a clown's face, and which will not be injurious? A. We do not know of any that will answer as well.

C. P. says: I am a manufacturer of paper goods and use many different knives. Can you favor me with a recipe for a mixture that I can apply to the interior of the knives that will cause the paper to leave them freely, and yet not soil the paper? A. We have applied to a number of paper houses but find that they use nothing for this purpose. You had better apply to some practical chemist.

J. N. H. asks: 1. Can you give a recipe for making white ink to write on colored paper with a steel pen? A. One part muriatic acid and twenty parts starch water. Very dilute oxalic acid may also be used. 2. How are rubber hand stamps made? A. A number of manufacturers have been visited, and they all decline to explain their processes.

O. C. K. asks: Can you give me a recipe for a wash, to be applied externally to the skin, to keep mosquitoes away? A. Make an extract of pennyroyal, by boiling in a limited quantity of water for a short time, and when cool add a small quantity of glycerin. We do not know of anything that will remove tattoo marks without injuring the skin.

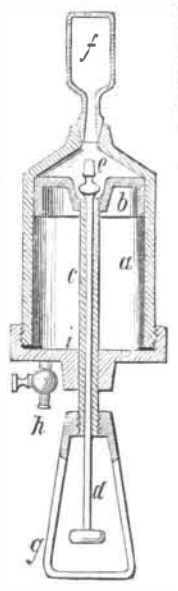
W. F. asks: How can I make the adhesive fly paper? A. A mixture of molasses and linseed oil will answer.

R. K. asks: Can you give me a good shape of furnace for heating locomotive springs to reset and temper them? A. Make a brick furnace somewhat longer than the spring plates, with the blast entering at the bottom, and the chimney having communication with each end of the furnace. Make coke (for use in the furnace) by banking up coal on a blacksmith's fire and burning the gas out of it, which coke will give you a clear fire in your furnace. The top of the furnace may be made to remove, so as to set thereon a tank of oil for tempering the plates.

J. S. H. asks: 1. What is a cheap, simple, and speedy method of utilizing bones on the farm as manure? A. The following plan has been suggested for utilizing bones: Place them in a large kettle filled with ashes, with about one peck of lime to a barrel of bones. Cover with water and boil. After twenty-four hours, nearly all the bones will be soft enough to be pulverized by hand. The rest may have to be boiled ten or twelve hours longer. When pulverized they will be in the form of paste, and suitable to mix with other manure. 2. What is a good process for converting molasses into vinegar? A. Vinegar may be made by mixing 16 parts of pure water, 1 part of sirup of molasses, and 1 part of baker's yeast at a temperature of about 80° Fah., and keeping the compound in a warm atmosphere from ten to thirty days. A little old vinegar added on the second or third day will aid the process.

C. J. M. asks: What will make and keep rain water sweet in a clean wooden cistern? I put one bushel of charcoal in each cistern, but it does not sweeten the water. If charcoal is good, how much and how often should it be renewed? A. If your cistern is clean, and the water also when it goes into the cistern, the impurity is due to the vegetable matter taken up from the wood of the cistern. If you use charcoal to purify it, the best way will be to filter the water through it. Alum is a more effectual agent for purifying the water. A drachm of pounded alum to a gallon of water is sufficient. After twenty-four hours the water will be cleansed. All wooden vessels to hold water should be charred inside.

A correspondent says, in reply to W. C. L., who asked in our issue of June 13, how to procure a vacuum in a common bottle: "I would suggest the enclosed plan, a modification of which I have used. Let *a* represent a cylinder, *b* a piston, *c* a hollow piston rod, *d* a sliding rod for holding stopper *e* a stopper, *f* a bottle, *g* a stirrup for withdrawing piston, *h* a discharge cock, *i* a cap which screws on to the cylinder. The mode of operation is as follows: Remove the cap, *i*, and fill the cylinder with water, replace the cap (which should be packed with rubber) and, while in this position, withdraw the piston until water appears all around it on the opposite side; also open the cock, *h*, and allow all air to escape. The apparatus should then be reversed, and placed upon a bracket for convenience in operation, and the space over the piston should be filled to overflowing. The bottle may then be filled and the stopper dropped in and pressed tight enough to keep its place when reversed. The stopper should be ground, as also the bottle, to fit their places. The bottle is then inserted in the cylinder, expelling the surplus water as it enters: and when firmly set, the stopper may be withdrawn by the sliding rod, *d*, which has a recess at the end to fit it. Now the piston may be withdrawn as quickly as convenient, the cock, *h*, being opened until the water has all left the bottle, when the stopper may be inserted by the rod, *d*, and the bottle removed. Solids may be introduced during this operation, and fluids at any time. The success will depend upon the scientific and mechanical accuracy of the operator, as the air must be expelled from the water, and care in manipulating must otherwise keep it out."



H. writes to corroborate I. F. B.'s statement concerning the water in the Humboldt and other valleys of Nevada being of a uniform level at various points in the valley, and that, if the streams were straightened and the level lowered by drainage, the frosts and damp and chilly nights would disappear, and farming be much more successful. "I have often observed the same fact in every portion of Nevada and in some parts of California; while here in Montana, we find that the water is never found lower than our streams, rising and falling with them, and in no month of the year can we be sure that we will not have frost. My experience, however, would lead me to differ from him very materially as to the cause and use of different means for the protection of vegetable life. I claim that the air is too dry. It allows the heat from the land to radiate into space with very little or no resistance. I think that I. F. B. will bear me out in this, that we are more liable to have severe frosts after a hot, dry day than after a cold and damp one, and more liable in a clear, still night than a cloudy or windy one. I have suffered intensely from heat two hours before sundown in some of those Nevada valleys, while two hours after it I was suffering just as much from cold. The air was very dry, allowing the heat of the sun to pass through it without resistance, and making the earth very hot; and when the supply was cut off, it would return with equal rapidity over the same free road. I think this is in accordance with Professor Tyndall's thorough and carefully conducted experiments on the subject (See Lecture IX, p. 373, of his work, "Heat as a Mode of Motion"), and I think that he gives us the true theory of frosts in the same work, p. 418. I would say it is the custom here when we anticipate a frost to irrigate or run the water quickly over the surface if possible. I have frequently saved my garden from frost when everything was cut down more or less around it, and that under circumstances that cannot all be accounted for in any other way than that the vapor rising forms a mantle or covering, preventing rapid radiation and thus saving the plants. There are many of your western readers that are deeply interested in this question. Agriculture in the mountains is fast becoming an important industry, and our great banes are early and late frosts. Perhaps some other readers could throw additional light upon the subject."

S. P. says, in answer to S. C. H., who wishes to mount a drawing on a paper background, and then varnish the surface: Paste the drawing on the background. Flour paste is as good as any; and when it is dry, size the surface with a solution of gum arabic or white glue. When that is dry, use any varnish you please. For a delicate picture or drawing, dammar varnish is the best; but it must be applied rapidly to secure an even surface.

M. R. H. asks: How can I render hard, and unaffected by heat, beechwood lasts which are daily subjected to 12 hours dry heat at a temperature of 290° Fah.? Common wooden lasts, undergoing this treatment, in a few months become dry and almost charred the edges break off and they are unfit for use.—C. L asks: What is the best way to can green corn and green peas?—H. J asks: Is animal life visible, by the use of the microscope, in the water from hot springs as well as in cold water?—A. E. R asks: 1. How can I cover the glazing on potter's ware with silver or mercury, so as to make it a reflector of light? 2. Of what is the ash which remains after lead has been heated above melting point for about twelve hours composed?—H. D. M. asks: How can I apply paraffin to make canvas waterproof? What shall I put in the paraffin to make it of a dark color?—S. C. H. asks: How can I prepare mocking birds' food?—J. A. J. asks: How can I make an aquarium?—W. E. L. asks: How can I line iron water tanks, to prevent rust in the water?—G. O. C. asks: How can I remove the blue color from polished steel?—H. D. M. asks: How can I clean petroleum barrels, so as to make them fit for holding cider, etc.?

COMMUNICATIONS RECEIVED.

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

On Feathered Arrow Heads. By F. E. M

On Aerial Navigation. By G. W. M.

Also enquiries and answers from the following:

O. D. O.—E. T.—M. P.—C. S.—G. J.—W. C. L. G.—J. M G. B. A.—E. P. W.—A. W. H.—O. S —J. B.

HINTS TO CORRESPONDENTS.

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

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

Hundreds of enquiries analogous to the following are sent: "Please to inform me where I can buy sheet lead, and the price? Where can I purchase a good brick machine? Whose steam engine and boiler would you recommend? Which churn is considered the best? Who makes the best mucilage? Where can I buy the best style of windmills?" All such personal enquiries are printed, as will be observed, in the column of "Business and Personal," which is specially set apart for that purpose, subject to the charge mentioned at the head of that column. Almost any desired information can in this way be expeditiously obtained.

[OFFICIAL.]

Index of Inventions

FOR WHICH

Letters Patent of the United States

WERE GRANTED IN THE WEEK ENDING

June 30, 1874,

AND EACH BEARING THAT DATE.

(Those marked (r) are reissued patents.)

Adding machine, C. C. and J. S. Moore	152,670
Agricultural implement ferrule, W. H. Bowman	152,454
Air compresser, W. S. Deeds	152,468
Air in rooms, cooling, R. W. Sanborn	152,519
Alkalies, putting up caustic, Herman & Holman	152,684
Auger, earth, W. Sandlin	152,522
Bale tie, cotton, J. M. Goldsmith	152,480
Baling plastering hair, W. R. King	152,560
Barrel head, O. Judge	152,495
Bedstead fastening, W. H. Elliott	152,621
Bilge water gage, J. D. Leach	152,537
Binder, temporary, H. A. Behn, Jr	152,590
Binder, temporary, J. Bennet	152,453
Boiler grate, steam, J. Sanders	152,692
Boot heels, burnishing, E. H. Downing	152,472
Boot seam, rubber, E. B. Stimpson	152,704
Boot soles, burnishing, Weeman & Dunnells	152,584
Bridge, iron truss, E. Hemberle	152,483
Bridle, R. W. Sanborn	152,518
Buckle, G. W. Bradford	152,455
Buckwheat, cleaning, D. Pease	152,679
Bung for casks, R. Pentlarge (r)	5,937
Burner, gas, T. F. McGhann	152,568
Burner, lamp, S. W. Fowler (r)	5,946
Cages, mat for bird, I. A. Singer	152,526

Car brake, J Heberlein 152,490
Car coupling, C. S. Davidson 152,532
Car coupling, E. S. Gillies 152,479
Car coupling, Hoopes & Smith 152,558
Car coupling, G. W. Kendrick 152,648
Car coupling, J. Pendergast 152,680
Car coupling, G. B Quigley 152,682
Car coupling, W. G. Smoot 152,573
Car coupling, G. Thomas 152,533
Car coupling pin die, J. T. Wilson 152,539
Car for transporting coal, J. Haines 152,630
Car heater, E. Densmore 152,615
Car refrigerator, J. J. Bate (r) 5,942
Car, street, J. Stephenson 152,701
Car stove, J. H. Mahrenholz 152,566
Car wheel, L. E. Truesdell 152,708
Car plow for unloading gravel, Finney *et al* 152,624
Carding machine roll, J. Greaves 152,628
Carriage wheels, making, S. Buck 152,557
Cart, hand dump, E. Jenkins 152,642
Chains, manufacture of, P. Bradford 152,547
Chimney cowl, R. N. Harlan 152,631
Chimney top ventilator, J. D. Kennard 152,647
Clothes dryer, E. F. Landis 152,497
Clothes pins, cutting, H. Mellish 152,569
Clothes wringer, T. E. McDonald 152,665
Coal box, G. S. Bruce 152,595
Cock, operating stop, J. F. Manahan 152,499
Corking apparatus, J. A. Miller 152,504
Corks, machine for cutting, F. L. Blair 152,545
Cotton worms, destroying, T. W. Mitchell (l) 5,935
Counter, movable store, J. Grimes 152,483
Cultivator, W. H. Farmer 152,623
Currycomb, F. L. Wright 152,512
Cylinders, device for centering, G. F. Hawley 152,487
Derrick, canal boat, S. Stevens 152,703
Desk, wall or bracket, L. A. Mancini 152,661
Dial plates, enameled, J. H. Robinson 152,689
Draft tongue iron, G. W. Taft 152,530
Drilling machine tripod, J. B. Waring 152,712
Egg carrier, J. L. Stevens 152,702
Elevator, C. Bradford 151,593
Elevator, M. L. Wyman 152,718
Elevator, endless chain, S. B. Castle 152,601
Elevator, bay, U. H. Shockley 152,525
Engine, rock drill, E. S Winchester 152,540
Engine, steam, E. S. Winchester 152,541
Engines, slide valve for steam, O. Kromer 152,653
Fence, J. E. Warren 152,535
Fence post, G. R. Clark 152,162
Fertilizer distributer, J. Hollingsworth 152,637
Firearm, breech loading, I. G. Beaumont 152,452
Flower stand, W. Snow 152,699
Fruit dryer, E. A. and C. W. Jones 152,644
Furnace, hot air, L. R. Satterlee 152,693
Gage and tram, carpenter's, G. F. Hawley 152,488
Gage, recording pressure, D. P. Davis 152,467
Gaiter, J. M Campbell 152,460
Gas, making hydrocarbon, W. H. Burr 152,596
Gas stove retort, J. Goldthorp 152,626
Gas, deodorizing material for, Mackenzie *et al.* 152,660
Gate, farm, C. T. Davison 152,613
Glass melting pot, R. Richardson 152,687
Grain binder, J. F. Gordon 152,481
Grain cleanerand scourer, R. Craig 152,609
Grain drill, J. C. Leffel 152,562
Grinding machine shoe and die, F. G. Belknap (r) 5,943
Harness loops, etc., pressing, A. W. Child 152,603
Harvester, J. H. Edward 152,622
Harvester binder platform, A. Elijah (r) 5,945
Harvester cutter, A. Harder 152,486
Hatchway, J. M. Strout 152,576
Hay fork pulley, A. J Nellis 152,672
Hay loader, J. Q. Collins 152,607
Heater, gravel, A. Walker 152,710
Hinge, M. L. Poirier 152,512
Hinge, gate, W. S. Whiting, Jr 152,714
Hog catcher, G. G. McManis 152,667
Horse boot, L. W. Moses 152,595
Horse boot, india rubber, D. N. Hurlburt 152,610
Horse detacher, T E. West 152,536
Ice house, R. W. Sanborn 152,521
Indexing, W. Knight 152,651
Iron, refining, R. S. Dillon 152,617
Ironing board, I. Samson 152,691
Ivory, artificial, W. M. Welling (r) 5,940
Jack, lifting, H. W. Cornell 152,608
Jack, lifting, C. S. S. Griffing 152,482
Jack, pegging, J. J. Stewart 152,528
Joint for stay rods, stop, C. Frizell 152,476
Knitting machine, E. P. Curtiss 152,466
Knob patch cutter, F. Norris 152,674
Lantern, M. W. House 152,493
Lantern, J. J. Marcy 152,663
Latch, locking, F. W. Folsom 152,475
Lead, manufacture of white, C. J. Sevin (r) 5,938
Leather glazing machine, W. Walter 152,711
Leather, cutting and embossing, A. Gould 152,627
Lighthouse burner, J. R. Wigham 152,538
Lock, seal, Cleuch & Bayly 152,605
Locomotive suction and pump, Lewis *et al* 152,659
Loom for weaving bags, etc., Laird *et al* 152,654
Loom for weaving wire, W. Taylor 152,531
Lounge, extension, H. J. Grimme 152,629
Marble, artificial, W. Burnet 152,159
Marble, imitation, T. and C. Symington 152,577
Medical compound, B. F. Ulmer 152,534
Metal twisting, L. J. Materson 152,501
Mill, grinding, W. J. and J. G. Lane 152,655
Mill and its appliances, rolling, J. L. Pennock 152,508
Millstone dress, S. Kelm 152,645
Miller box, A. F. Strong 152,529
Mortising machine, G. B. Durkee 152,473
Mowing machine, W. A. Kerby 152,531
Oil, compound paint, T. Ruston 152,690
Oils, etc., distilling, R. Klosterman 152,650
Ordnance, P. M. Parsons 152,678
Ores, etc., separating, J. J. Willis 152,715
Ores, etc., cooling roasted, R. Teats 152,532
Organ coupler, E. B. Carpenter 152,599
Organ coupler, C. Schallberg 152,694
Organ reed board, J. R. Perry (r) 5,954
Paint compound, G. W. Pond 152,513
Paint, compound for cleaning, S. Short 152,697
Pan forming machine, F. D. Secor 152,523
Paper box, H. R. Heyl 152,636
Paper box machine, E. B. Beecher 152,544
Paper, grinding wood for, J. G. Moore (r) 5,936
Parcel holder, G. B. Clarke 152,604
Pavement, R. and T. Winans 152,716
Photographic pictures, taking, N. Weston 152,713
Piano tuning pin, M. Delaney 152,470
Pile, D. Jenkins 152,643
Pill machine, P. Cauhape 152,461
Pill machine, J. A. McFerran 152,666
Pipe cut-off and strainer, E J. Knowlton 152,652
Pipes, laying cement, J. Loeffler 152,654
Planter and spade, corn G. W. Doty 152,471
Planter, corn, G. H. Hume 152,494
Planter, corn, Millar & Todd 152,669
Planter, cotton seed, J. Dana 152,611
Planter, hand corn, J. C. Leffel 152,563
Plate rack, J. J. Collins 152,550
Plow, E. Wiard (r) 5,941
Plow and cultivator point, O. F. Phillips 152,519
Plow, gang, A. H. Burlingame 152,458
Plow, gang, F. R. Crothers 152,464
Plow irons, die for welding, C. H. Thompson 152,570
Plow, riding, J. H. Payton 152,507
Plowshares, die for forming, C. H. Thompson 152,578
Pocket book, A. M. Le Vino 152,498
Printing press, J. W. Kelberg 152,646
Printing press feed, R. M. Hoe (r) 5,947
Printing press inking apparatus, J. Bryson 152,548
Pully block, Hewitt & Goff 152,635
Pump, W. M. Brooke 152,594
Pump, E. Rhodes, Jr 152,684
Purifier, middlings, G. Parker 152,677
Purifier, middlings, Todd & Keyser 152,582
Railway chair, W. Mansfield 152,567
Railway, elevated, R. H. Gilbert 152,625
Railway rail, J. M. May 152,502
Railway rail joint, Crowley & Kelley 152,551
Railway switch, C. H. White 152,586
Railway track, A. Dehuff 152,469
Refrigerator, transporting, R. W. Sanborn 152,520
Register, passenger, C. Decker 152,614
Rocking horse, W. J. Emery 152,474
Roll for troops, permanent, C. Blattner 152,591
Roof, thatched, F. Geier 152,478
Roofing composition, McDerby & Stevens 152,503
Roofing, etc., compounds, H. W. Johns (r). 5,948 to 5,951
Safe, fireproof, Eurich & Raettig 152,553
Safes, etc., lining for, W. H. Butler 152,598
Sash fastener, Richards & Fowler 152,685
Saw gummer, W. B. Noyes 152,675
Sawing machine, lath, P. W. Hart 152,632
Sawing machine, stave, N. H. Smith 152,698
Scafold, H. Pickett 152,511
Screw-cutting die plate, F. D. Bliss 152545
Seeding machine, J. H. & J. W. Thomas 152,706
Separator, clover, Z. Miller 152,668
Separator, grain, J. F. Pool 152,514
Separator, ore, G. Copeland (r) 5,944
Sewing machine, W. W. Abbott 152,519
Sewing machine, Dinsmore & Carter 152,618
Sewing machine, I. Manning 152,500
Sewingmachine attachment, stay, I. Manning 152,662
Sewingmachine motive power, D. B. Herrinton 152,633
Sewing machine treadle, D. A. Swift 152,705
Sewing machine tucker, J. H. Bean 152,543
Shaft, flexible, N. Stow (r) 5,939
Shafting, etc., straightening, C. Scofield 152,695
Shingle machine, I. M. House 152,638
Ship's winch, T. L. Hubbard 152,639
Shoe soles, shaping, J. B. Johnson 152,559
Shoe supporting mechanism, E. Lemercier (r) 5,952
Shovel block die, C. H. Thompson 152,580
Shovels, manufacture of, J. T. Tyler 152,583
Shutter fastening, W. E. Selleck 152,696
Shutter worker, D. Gross 152,485
Shutter worker, J. W. Jedkins 152,641
Shutter worker, H. H. Sherwood 152,524
Sink trap, H. Miller 152,571
Skate, J. A. Whelpley (r) 5,955
Sled, J. L. Tompkins 152,707
Soldering metal tubing, S. R. Tucker 152,709
Sole nailing machine, E. P. Richardson 152,686
Spark arrester, E. Osborn 152,676
Spring, elliptic, E Cliff 152,606
Stove, Perry & Dickey 152,509
Stove, base burning, E. Bussey 152,597
Stove, cooking, Cawthon & Ezekiel 152,602
Stove grate, coal, H. Gaskell 152,477
Stove lining, W. J. Woodside 152,587
Stove pipe damper, J. M. Horton 152,492
Stove, railroad car, J. H. Mahrenholz 152,566
Stove, center piece and cover, Melville *et al* 152,570
Suspenders, H. A Bowne 152,592
Switch locking apparatus, Dikeman & Lovell 152,615
Ticket clasp, Clay & Dorr 152,549
Tobacco, preparing, W. S. Kimball 152,649
Tool handle, W. J. Thomson 152,581
Toy, A. & G. Nebeker 152,671
Toy, G. Yung 152,588
Toy, musical, B. Gade 152,554
Toy, wind wheel, W. Gorton 152,555
Trap, animal, R. S. Pardee 152,506
Trap, animal, W. S. West 152,587
Trap, fly, H. Carter 152,600
Tubing, shaving soldered, A. H. Wells 152,585
Tyre tightener, A. Hollingsworth 152,491
Tyres machine for setting, S. Buck 152,456
Valve for hydraulic purposes, C. A. Condé 152,463
Vehicle, M. V. Nichols 152,673
Vehicle brake, W. H. H. Snellbaker 152,574
Vehicle seat, J. A. Curtis 152,611
Vehicle tyres, clip for, L. Rundell 152,516
Vehicle wheel, J. W. Davis 152,612
Velocipede, C. R. M. Pohlé 152,686
Ventilator cap, G. Kavanaugh 152,490
Ventilator or screen, automatic, I. A. Salmon 152,517
Vent, liquid, Love & Talley 152,565
Wagon gearing, R. H. Starks 152,527
Walls, ornamenting, J. J. & J. P. Maybery 152,664
Washing machine, L. M. Doddridge 152,619
Washing machine, H. Grandjean 152,556
Washing machine, W. S. Spaulding 152,575
Waterproof fabric, G. M. Allerton 152,451
Water trap, J. A. Lowe (r) 5,953
Water wheel, M. D. Grow 152,481
Water wheel, J. W. Ross 152,515
Weather strip, S R. Stanton 152,700
Weaver's harness, making, J. H. Crowell 152,465
Whip socket, W. W. Richardson 152,688
Window screen, E. B. Lake 152,656
Window screens, ornamenting, F. J. H. Wogram 152,717
Wire, device for coiling, Haskell & Garrett 152,557
Wood-preserving compound, J. A. Draper 152,620
Wood surfaces, smoothing, G. Munger 152,572
Yarn drying machine, J. Ramsden 152,683
Yarn reeling machine, W. H. Leach 152,658

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:

30,191 —PAPER BAG MACHINE.—H. G. Armstrong. Sept. 16.
30,233 —MARTINGALE RING.—D. W. C. Lockwood. Sep. 16.
30,360.—PROPELLER.—H. Stanley. September 23.

EXTENSIONS GRANTED.

29,012. —HORSE RAKE.—F. Seidle *et al.*
29,035.—SEWING MACHINE.—J. First.

DESIGNS PATENTED.

7,504 —PITCHERS.—J. S. Atterbury *et al.*, Pittsburgh, Pa.
7,505.—COLLAR BOX.—E. J. Frost, Philadelphia, Pa.
7,506.—FRAME CORNERS.—P. J. Hardy, New York city.
7,507.—HANGING BASKETS.—A. H. Hews, Cambridge, Mass.
7,508.—SHOW CASES.—A. Lange *et al.*, St. Louis, Mo.
7,509.—MONUMENTS.—A. E. Perrin, Central Falls, R. I.
7,510.—PAPER CLIP.—D. F. Smith *et al*, Haverhill, Mass.
7,511 to 7,513.—FOUNTAINS AND VASES.—W. Tweeddale *et al.*, Brooklyn, N. Y.
7,514 to 7,515.—STOVES.—J. Benner, Philadelphia, Pa.
7,516 & 7,517.—LABELS.—J. D. Frary, New Britain, Conn.
7,518.—THERMOMETER BACK.—G. Gano, Cincinnati, Ohio.
7,519.—RANGE.—J. Martino, Philadelphia, Pa.
7,520 to 7,522.—OIL CLOTHS.—C. T. Meyer *et al.*, Bergen, N. J.
7,523.—HEAD LIGHTS.—J. Radley, Brooklyn, N. Y.
7,524.—BAND COMB.—W. Mullee, Chesterfield, Pa.

TRADE MARKS REGISTERED.

1,852 to 1,854.—GLUE, ETC.—Bacder & Co., Philadelphia, Pa.
1,855.—WEARING APPAREL —Caswell & Co., Har ford, Ct.
1,856.—TOBACCO —Frishmuth & Co., Philadelphia, Pa.
1,857.—LUBRICATING OIL.—A. B. Hinman, Detroit, Mich.
1,858.—HORSE BRUSHES.— C. W. Maguire Brush Co., Brooklyn, N. Y.
1,859.—IRON ORES — York Co. Iron Co., Pa.
1,860.—WROUGHT IRON & STEEL.—York Co. Iron Co., Pa.
1,861.—REFINED LARD.—W. J. Wilcox & Co., N. Y. city.

SCHEDULE OF PATENT FEES.

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

CANADIAN PATENTS.

LIST OF PATENTS GRANTED IN CANADA

JULY 6 TO 8, 1874.

3,590.—J. Corbett, Hartford, Hartford county, Conn., U. S. Improvements in registering ticket punches, called "Corbett's Improved Registering Ticket Punch." July 6, 1874

3,591 —A. Jeffery, Guelph, Wellington county, Ont. Improvement in looking glass holder, called "Jeffery's Improved Looking Glass Holder." July 6, 1874.

3,592.—P. Trudeau, Ottawa, Carleton county, Ont. Améliorations aux établis de ménuisiers, dit "Etablis Trudeau." (Improvements in Joiner's Bench." July 6, 1874.

3,593.—R. B. Underhill, Corinth, Alcorn county, Miss., U. S. Improvements in apparatus for extracting coffee, called "Underhill's Improved Coffee Extractor." July 6, 1874.

3,594.—J. Young, Goderich township, Huron county, Ont. Improvements in couplers for coupling the rods or shafts of threshing machines and other machines, called "Young's Safety Coupling." July 6, 1874.

3,595.—J. E. Sanders, New Bedford, Bristol county, Mass., U. S. Improvement in flower pots, called "Sanders' Improved Flower Pot." July 6, 1874.

3,596.—J. Davis, St. Paul, Ramsey county, Minn., U. S. Improvements in pipe stems, called "Davis' Pipe Stem." July 5, 1874.

3,597.—M. Bryant, Northport, Suffolk county, N. Y., U. S. Improvement in windlasses for presses, called "Bryant's Improved Windlass Press." July 6, 1874.

3,598.—L. B. Bishop, Horton, Nova Scotia. Improvement on a machine for spinning wool and cotton, called "Bishop's Improved Spinning Wheel." July 6, 1874.

3,599.—J. H. Steiner, Albany, N. Y., U. S. Improvements on fire extinguishers, called "Steiner's Repeating Fire Extinguisher." July 6, 1874.

3,600.—F. R. Smith, Bennington, Bennington county, Vt., U. S. Improvements in bed springs, called "F. R. Smith's Bed Spring." July 6, 1874.

3,601.—J. Brooks and A. Bourassa, Coaticook, Stanstead county, P. Q. Washing machine, called "Brooks & Bourassa Lightning Washing Machine." July 6, 1874.

3,602 —W. Clark, Brampton, Ont. Useful clothes line, rope, and other fastener, called "Clark's Clothes Line, Rope, and other Fastener." July 6, 1874.

3,603.—J. H. Wentworth, Boston, Suffolk county, Mass., U. S. Improvement in stoves, called "Wentworth's Improvements in Stoves." July 6, 1874.

3,604.—Mrs. H. R. Tracy, New York city, U. S. Improvements in sewing machine cabinets, etc., called "Mrs. H. R. Tracy's Sewing Machine Cabinet." July 6, 1874.

3,605.—D. Ashbury and E. A. Osborne, Charlotte, Mecklenburg county, N. C., U. S. Improvements on apparatus or process for bleaching, washing, making extract, and for other analagous purposes, called "Ashbury's & Osborne's Apparatus and Process for Bleaching, Washing, Making Extract, etc." July 6, 1874.

3,606.—H. M. Skinner, Rockford, Winnebago county, Ill., U. S., and L. W. Doty, Marengo, McHenry county, Ill., U. S. Improvements on sulky or riding plows, called "The Skinner Riding Plow." July 6, 1884.

3,607.—M. May and F. May, Springfield, Clark county, O., U. S. Improvements on clothes wringing machines, and benches therefor, called "May's Wringing and Wash Bench." July 6, 1874.

3,608.—C. Wheeler, Jr., Auburn, Cayuga county, N. Y., U. S. Improvements on combined or interchangeable reaping and mowing machines, called "Wheeler's Combined Reaping and Mowing Machines." July 6, 1874.

3,609.—W. N. Whiteley, Springfield, Clark county, O., U. S. Improvements on machines for reaping and mowing, called "The Champion Harvester." July 6, 1874.

3,610.—J. W. Cuthbertson, Brantford, Brant county, Ont. Improvements on the mops used for scrubbing floors, etc., called "Cuthbertson's Self Wringing Mop." July 8, 1874.

3,611 —A. Burbank and H. E. Shaffer, Rochester, Monroe county, N. Y. Improvements on lamps, called "Burbank's Kerosene and Air Light." July 8, 1874.

3,612.—J. Hugbes, Bloomington, McLean county, Ill., U. S. Improvements in machines for repairing boiler flues, called "Hughes' Machine for Repairing Boiler Flues." July 8, 1874.