

J. & T. G. say: In burning bricks, we find that, by mixing anthracite coal dust with the clay, the bricks are liable to swell, many of them presenting the appearance of large doughnuts. When broken, they have a dark gray metallic appearance, and are hard and brittle. It is usually said, when this happens, that the fire has been pushed too rapidly. No doubt this is true to a certain extent; for if the fires are kept low until bricks are well heated, there is little or no danger of it happening. But it is not absolutely true, because bricks that are in immediate contact with the fire will usually escape this swelling, while others, farthest removed from it, will swell. We think that it is caused by want of a sufficient amount of air to support combustion properly. Our chief reason for this view is that much of the coal in these swelled bricks is not consumed, and yet their appearance indicates that the inside of them must have been in a molten state. They look as if the material of which they are composed had been in a boiling condition, so great has been the heat generated within them. Moreover, in the individual brick, the swelling is greatest at the center; and when set close together, they will swell, while all the bricks around them that are set with space between them will be free from swelling. This exists in various degrees in some bricks; it can hardly be seen in others, as above stated. The discoloration of bricks where they rest on each other, is another objection to the use of coal dust. Hence we cannot use it in our front or pressed bricks. Those parts of the brick where they rest on each other will be of a purple color, while the rest of the brick will be red. What we want to know is: Can any substance be mixed with the coal dust and clay that will supply the place of oxygen for the coal dust, so that it will not swell or discolor the bricks while burning, or cause them to become discolored when exposed to the weather? When we speak of coal dust, we mean the refuse of the coal yards. If this were ground fine, we think it would lessen the liability to swelling, but would not prevent the discoloration. A. The swelling of your bricks is due probably either to the escape of moisture in the baking, or the gases generated in the combustion of the coal. The red color of bricks is due to the red oxide of iron, which is formed during the intense heat of the kiln. Where they press against one another the heat is less intense, and not sufficient to cause complete decomposition of the iron compound and the formation of the red oxide. This is the cause of the purplish color where the bricks were in contact in the kiln. There is no cheaper source of oxygen than the atmosphere. Grinding the coal very fine might obviate some of the difficulty.

F. E. says: 1. I have two small rooms, about 14x15 feet, which are separated by a closet 5 feet wide. I keep in each room a stove, but I think that perhaps one stove could heat the two rooms, if a drum could be put in one room and the pipe from the stove in the other room be led through into the drum. I wish the drum to be as near the floor as a stove. In order to do this, the pipe from the top of the stove must be lowered about 2 feet, instead of going upwards. Would the draft of the stove be the same? Would the escaping heat of the stove sufficiently heat the room by going through that drum? Is so, of what size and how constructed should the drum be? 2. By what kind of an attachment or connection, can a lever and a wheel be so arranged that, by turning the wheel always in one direction, the lever would move up and down? 1. Probably such an arrangement would answer. Any reliable stove dealer will fit it up for you. 2. A cam and yoke would effect the desired object.

T. D. Q. Jr. says: 1. I have usually cleaned my miniature engines with emery cloth: what is the best way to clean out any emery which may have fallen into the cylinder, steam ways, etc? I usually pour alcohol or benzine to kill the oil, and then let running water through. Is there anything better? 2. Is water, charged with oxalic acid until it will take up no more, too strong for cleaning brass? 3. Is it necessary to clean and polish with whiting, or will leather alone be sufficient? 4. What is about the proportion of muriatic acid and alum in gold coloring? Will the brass require to be washed with water when colored with muriatic acid and alum? 5. What kind of bronzing can be easily applied to brass like that used on gas fixtures? 6. What kind of gilt wash can be easily and firmly applied to iron? 7. What coloring or lacquer is applied to the brass snaps and window raisers which we see in cars, and which look as if they were taken out after being cast, the rough edges filed off, and then dipped into something? What is a good lacquer to apply to brass, already polished, to keep it bright? A. 1. Take them apart, cover the pieces with oil, and wipe clean. 2. We think not. 3. The addition of whiting will probably be an improvement. 4. 6, 7. You will find directions about gold coloring, on page 13, current volume. 5. See p. 331, vol. 20. Dissolve 8 ounces of seed lac in one quart of alcohol.

J. B. G. asks: In an article in your No. 24, volume 29, on the ventilation of the Senate Chamber, it is said that the exhaust apparatus takes the air from the upper part of the room, which is contrary to the philosophy entertained by many in this part of the country. Indeed, all the buildings I know of have the air taken from openings in the floor, the idea of course being that the vitiated air, being heavier than pure air, is more easily taken from the floor: besides the warm air from the registers, rising immediately to the upper part of the room, is not drawn out before having performed its work. What is your opinion? A. It is impossible to give a general rule as to where the foul air of a room is to be drawn off, independently of all other considerations. The air may be heated before it is forced into the room; and if a current is established from the bottom, there is no objection to removing the air from the top.

H. J. asks: 1. Is it common for persons to lose their memory by fright? I was blown up on a steamboat some years ago, but not injured, and have not had my memory since. 2. I was on board a boat and she was blown up; I am positive there was a full supply of water in her boilers. There were some persons standing within 3 feet of the boilers, and some immediately over them. Some 25 were killed and wounded, yet no one was scalded. What became of the water? A. 1. Such action occasionally takes place, but we hardly think that it is common. 2. The hole may have blown out in the lower part of the boiler.

B. F. T. asks: Has any person a patent on the application of paper pulp to heated surfaces, as non-conductors of heat, as on steam boilers, pipes, etc? 2. Can India rubber be dissolved in water so as to be mixed with other substances and become dry and hard? A. 1. We believe there is such a patent. 2. No.

R. H. asks: How is paper prepared so that, when written with an iron stylus, the electrical current will discolor it? A. Dtp common printing paper in a solution of ferrocyanide of potassium. The passage of electricity through the paper, thus prepared, makes blue marks, the salt being converted into Prussian blue.

N. O. J. asks: 1. If I have a round timber, out of which I want to cut a rectangular beam, how can I find the sides of the beam expressed in function of the diameter of the timber? 2. What is the formula for the expansion of water by heat? 3. In Ganot's "Physics" there are the following formulas, by Dr. Matthiessen: $Vt = 1 - 0.0000253(t-4) + 0.000003389(t-4)^2 - 0.0000007173(t-4)^3$ between 4° and 32° C. and $Vt = 0.999695 + 0.000054724t^2 + 0.0000001126t^3$ between 30° and 100° C.; but it is not explained what is meant by V and t. A. The side of the greatest square that can be inscribed in a circle is 0.707 of the diameter. 2. The first formula may be thus translated: If we call the volume of a given weight of water, at a temperature of t° centigrade, unity, the volume at any other temperature, t, between 4° and 32° , is equal to one, minus 0.0000253 times the given temperature, diminished by 4, + 0.000003389 times the square of the given temperature, less 4, + 0.0000007173 times the cube of the given temperature, less 4. The translation of the other formula is similar. Vt in the first member of the equation means the volume at the temperature, t, which temperature is to be substituted for t in the second member.

A. R. asks: How small in size did Newton say that our globe could be pressed or squeezed to free it of its molecules? A. We do not remember that Newton ever made such a statement.

P. P. asks: What is the principal difficulty in running band saws in ordinary lumber mills, and why are they not used more extensively? Is not the power required to drive a band saw less in proportion to width of kerf, the rate of sawing being the same? A. The band saw is comparatively a recent invention, but already it is being largely introduced. We do not think there are any great difficulties in its use. The power required is not less than with a properly arranged saw of the ordinary kind.

W. R. G. asks: 1. In calculating the power of water wheels, is there anything allowed for friction? A. Generally, yes.

R. S. F. asks: Is there such a thing as a recording dynamometer for use on steam engines, water wheels, and other motive powers? A. We believe there are such machines, but they have not come into general use on account of their complications, expenses, etc. The field is still open for the inventor who can produce a better device.

D. M. L. asks: 1. How is the monthly average of a thermometer obtained? On some days, at the hour of observation, it indicates above zero and at others below. 2. What is the mean average of the following record for ten days: 1st, 10° above; 2d, 8° above; 3d, 3° below; 4th, 4° below; 5th, 2° above; 6th, 5° above; 7th, 1° below; 8th, 3° below; 9th, 9° above; 10th, 4° above. A. 1. Take the algebraic sum of the readings, and divide by the number. 2. The mean temperature, as shown by these observations, is $(10^\circ + 8^\circ - 3^\circ - 4^\circ + 2^\circ + 5^\circ - 1^\circ - 3^\circ + 9^\circ + 4^\circ) \div 10 = 2.2^\circ$ above zero.

D. M. A. says: A board is 12 feet long and 1 inch thick. At one end it is 3 inches wide, at the other end 12 inches wide. Where must this board be cut into between the ends so as to have the same amount of lumber in each piece? A. Let A B C D represent the board. Suppose the problem to be solved, and that E F, or b, drawn at a distance, x, above C D, divides the board into two equal parts. It is thus required to find the value of x. It is easy to see that if the sides of the board were continued upwards until they met, as at G, the length would be 18 feet. We then have a triangle, G C D, with a line, E F, parallel to the base, C D. Hence

$216 : 216 - x :: 12 : b$, and $b = 12 - \frac{x}{18}$. Having found the top and height of the piece, E F C D, we can calculate the area, in terms of the sides, and make this equal to half the area of the board. Then $(12 - \frac{x}{36}) \times x = 576$. Solving this equation for x, we find the height above C D, at which the board must be cut, is 4 feet, 7 inches, nearly.

A. L. asks: Can you tell me how to stain hard wood imitation of ornamental woods? A. This subject is a very complicated one, and a full description of the processes would occupy too much of our space. Your best course would be to obtain a good book on the subject.

M. asks: What is a good metal that can be melted over a charcoal fire, be easily dressed up for making models, and will be quite stiff when cold? I have been using lead, tin, and antimony, but think that perhaps I do not get right proportions. A. Increase the lead to make the alloy softer, and vice versa.

A. B. P. asks: How can I make an amalgam for an electrical machine? A. Take zinc 1 oz., grain tin 1 oz., mercury (hot) 3 ozs. Stir well together, and powder when cold. Mix with a little tallow.

A. Z. B. asks: 1. What treatment should paint brushes be subjected to so as to keep them from getting hard and matted together after using? A. Soak in linseed oil and wash the oil out with soapy water.

F. A. R. asks: 1. What are the meanings of the terms, golden number, solar cycle, and epact, found in an almanac? 2. How is coal tar made? 3. How is apple whiskey made? A. 1. The cycle is the period of time after which the same days of the week recur on the same days of the year. This period of the sun (solar cycle) is 28 years, and of the moon's changes 19 solar years. The golden number is the number of the year in the cycle. To find the golden number add 1 to the date, and divide by 19. The remainder is the number. Thus $1874 + 1 = 1875 \div 19 = 98$ and 13 remainder. The epact is the moon's age at the end of the year; and if we take the epact corresponding to the year's golden number, we can obtain the dates of the new moons, and thence the dates of Easter, Lent, and Whitsuntide. 2. It is a by-product of the distillation of coal, as in making illuminating gas. 3. By the distillation of cider.

L. J. O. asks: What are the use and meaning of the marks over certain letters, as in Professor Orton's letters? A. The marks you refer to are the accents on the letter n (ñ) in the Spanish language. The effect of the accent is the same as if g were before the n in French, as in Bologna (pronounced Bolonya). Thus in Spanish, cañon is pronounced canyon, peñas, penyas, etc.

J. S. asks: What has become of the boiler testing board? "I sent them a safety valve for trial, and would like to know what they are doing." A. They have suspended operations until spring.

S. H. asks: On what day of the week did September 21, 1817, fall? A. Sunday.

P. asks: How can I remove oil from a printed paper? A. Apply powdered French chalk, made into a paste with water and allowed to dry on the spot.

F. A. B. sends the following recipe for blackboard composition: Alcohol, $\frac{1}{2}$ gallon; gum shellac, $\frac{1}{2}$ lb.; lampblack, $\frac{1}{2}$ lb.; Venice turpentine, 4 ozs. Dissolve the shellac in the alcohol, and add the other ingredients. If it gets too thick, thin with alcohol.

P. P. P. asks: 1. What makes a person shake when having a chill? 2. What causes the cold and hot feelings during a chill? 3. When death is caused by a congestive chill, what part of the body is so affected that it causes death?—G. B. asks: 1. How is the deep scarlet color of the geranium flower produced on wax? 2. How can I prevent white wax from turning yellow?—S. B. R. asks: How can I dye furs?—A. G. P. asks: Which is the largest pump in the world?—J. S. asks: Can anyone estimate the annual cost of the artificial light used all over the world?—T. F. asks: How can I remove the smell of cod liver and castor oils?—J. H. asks: How is a hygroscopic (a paper altering its color with the humidity of the atmosphere) made?—G. P. Z. asks: Is there any remedy that will remove hair from any part of the face, without leaving any permanent mark or signs of its application?

COMMUNICATIONS RECEIVED.

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

On a Specific for St. Vitus' Dance. By A. S.
On the Phonetic System. By A. F. S.
On a Mathematical Discovery. By T. F.
On Ventilating a Church. By R.
On a Theory of the Origin of the Solar System. By C. D.
On Lunar Acceleration. By J. H.
On Minerals in Tennessee. By A. D. M.
On Steam Power in Philadelphia. By L. B. Jr.

Also enquiries from the following:

T. R. & S.—C. T.—J. J. K.—J. D. B.—G. W. B.—S. M. D.—Z. T. D.

Correspondents in different parts of the country ask: Who makes the best breech-loading shot gun? Who sells machines for making buttonhead rivets? Who makes kilns for burning charcoal? Who makes mill-stoned dressing machines? Makers of the above articles will probably promote their interests by advertising, in reply, in the SCIENTIFIC AMERICAN.

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.

[OFFICIAL.]

Index of Inventions

FOR WHICH

Letters Patent of the United States WERE GRANTED IN THE WEEK ENDING

January 6, 1874,

AND EACH BEARING THAT DATE.

[Those marked (r) are reissued patents.]

Air cooling, A. Muhl..... 146,267
Alkalies, package for caustic, H. B. Hall..... 146,179
Artist's ink slab, W. Keuffel..... 146,187
Auger bits, die for forming, J. Swan..... 146,212
Auger coupling, earth, W. W. Jilz..... 146,257
Bed bottom, Briel & Krieger..... 146,227
Bed bottom, Deal & Hobbs..... 146,125
Bed bottom spring, D. W. Whitaker..... 146,299
Bedstead and crib, C. Morgan..... 146,265
Bedstead, etc., invalid, I. M. Rhodes..... 146,281
Belt tightener, S. L. Gould..... 146,132
Billiard register, C. F. Washburn..... 146,218
Bit stock, Chandler and Folsom..... 146,123
Boiler, etc., locomotive, N. F. B. De Chodsko..... 146,171
Boiler water feed, etc., M. Reeve..... 146,145
Books, fastening leaves in, L. Messer..... 146,261
Boot counter stiffener, J. L. Hatch..... 146,252
Boot heels, G. W. Keene (r)..... 5,723
Boot heel, forming, G. W. Keene (r)..... 5,723
Boot heels, etc., nailing, J. M. Watson..... 146,152
Boot solecutter, H. T. Marshall..... 146,241
Boot, sole for, Pebbles & Co..... 146,276
Boring apparatus, etc., earth, C. Pontez..... 146,202
Boring machine, G. Gardner..... 146,246
Bottle stopper, W. T. Fry..... 146,129
Bridge link bar, J. Christie..... 146,165
Brush, stove blacking, Inglis & Pinkerton..... 146,183
Buttons, etc., J. F. Baptestrosses..... 146,223
Cage, bird, W. O. Grover..... 146,219
Cam sectional, J. F. Mallinckrodt..... 146,193
Car axle, lubricating, P. Bauer..... 146,160
Car coupling, X. Krapf..... 146,134
Car coupling, F. Thorpe..... 146,214
Car coupling, A. Willson..... 146,154
Car spring, railroad, J. W. Evans..... 146,238
Card for wrapping thread, H. Suto (r)..... 5,725
Carpet fastener, F. Graff..... 146,248
Carriage, child's, L. P. Tibbals..... 146,215
Carriage seat, H. W. Quinn..... 146,278
Carriage top, J. Catrow, Jr..... 146,230
Carriage top, C. A. Dearborn (r)..... 5,720
Chuck, W. H. McCoy..... 146,262
Cigars, machine for molding, H. Dombrowski..... 146,126
Clamp, I. Kenney..... 146,190
Clamp, J. F. Schneider..... 146,207
Clamp, floor, R. C. Davidson..... 146,170
Clock dial, J. De Laforgue..... 146,236
Clothes dryer, F. Lyford..... 146,260
Clover, etc., thrashing, Lippy & Co..... 146,137
Coal, etc., discharging, J. Foreman..... 146,242
Cooking apparatus, A. E. Neitz..... 146,142
Corn cob separator, Galt & Tracy..... 146,245

Corset, G. L. Eason..... 146,127
Cotton plants, sprinkling, W. T. Robinson..... 146,205
Cultivator, sugar cane, Von Phul & Mallon..... 146,21
Curain tassel clasp, A. A. Lothrop..... 146,13
Curve scriber, I. Kenney..... 146,189
Cutter, rod, D. S. Merritt..... 146,134
Dental plates, alloy for, E. Conway..... 146,233
Digger, potato, R. B. Evans..... 146,174
Digger, potato, H. Strait..... 146,148
Drill chuck, H. M. Olmstead..... 146,143
Duster handle, etc., E. M. Forrester..... 146,128
Egg carrier, M. A. Franklin..... 146,243
Elevator, ice, J. S. Johnson..... 146,253
Elevator, water, T. J. Christy..... 146,231
Engine, steam, Field & Cotton..... 146,329
Engines, packing for steam, W. Beschke..... 146,129
Faucet, compression, J. T. Hayden..... 146,253
Fertilizers from waste liquors, B. F. Shaw..... 146,255
Flue cleaner, H. Freeman..... 146,176
Flue cleaner, H. Freeman..... 146,177
Flue cleaner, H. Freeman..... 146,178
Fork, horse hay, E. Mishler..... 146,195
Forms, cutting irregular, J. P. Grosvenor (r)..... 5,721
Fruit gatherer, W. F. Towns..... 146,151
Furnace mouths, arch iron for, T. Sharts..... 146,147
Furnace, portable, J. C. Brewer..... 146,226
Gage for edgers, S. Taylor..... 146,202
Gas nipples, holding, L. W. Stockwell..... 146,291
Gimp, covering strands for, R. C. Alton..... 146,222
Grain binder, Culbertson & Edgar..... 146,169
Grain, rubber for separating, Andrews & Co..... 146,154
Grinding machine, W. J. Reagan..... 146,279
Grinding rolls, machine for, N. Gavitt..... 146,247
Hammer eyes, forming, H. H. Warren..... 146,217
Harrow, wheel, E. Bayliss..... 146,241
Harvester, J. Beach..... 146,161
Hatchway, self-closing, W. A. Morrison..... 146,141
Hemming, etc., attachment for, J. T. Jones..... 146,185
Hinge, A. O'Keefe..... 146,270
Hook, whitetree, J. Behel..... 146,131
Horseshoe blank, J. Russell..... 146,146
Iron, puddling, F. A. Lelaurn..... 146,239
Jack, lifting, E. B. Cump..... 146,235
Jack, lifting, R. Yale..... 146,203
Jeweler's hinge stock die, H. N. Page..... 146,232
Ladder fire escape, M. Parent..... 146,274
Lamp, ship's, Hinrichs & Co..... 146,180
Leather, crimping, Thompson & Co..... 146,213
Lock, bag, E. J. Riley..... 146,282
Lock, combination, A. E. Pickle..... 146,201
Lock for drawers, etc., J. Palmer..... 146,273
Lock, seal, J. C. Wands..... 146,296
Lock, permutation, W. Kock..... 146,191
Locomotive water supply, W. E. Prall..... 146,277
Loom shed, G. Crompton, (r)..... 5,718
Loom shed, G. Crompton, (r)..... 5,719
Mechanical movement, B. Fruse..... 146,214
Mechanical movement, J. Woolf..... 146,201
Medical compound, P. Hunter..... 146,133
Medical compound, E. W. Ober..... 146,199
Medical compound, J. W. Tallmadge..... 146,149
Milling machine, D. Slate..... 146,287
Molding crucibles, P. Wilkes..... 146,220
Music holder, sheet, H. B. & G. S. Ladd..... 146,192
Music leaf turner, W. H. King..... 146,158
Nail, picture, J. O. Niles..... 146,269
Neck tie shield, S. H. Eisenstaedt..... 146,173
Nut machine, S. H. Wright..... 146,202
Optical illusions, T. W. Tobin..... 146,293
Ores, etc., sampling, J. Collom..... 146,167
Painting broom handles, J. Reif..... 146,201
Paper bags, making, C. T. Packer..... 146,271
Paper cutting machine, T. B. Dooley..... 146,237
Paper lining machine, B. F. Field..... 146,240
Photographic back ground, P. C. Nason..... 146,196
Pipes and tubing, W. V. Phillips..... 146,144
Plane guide, W. H. Shippe..... 146,208
Planter, cotton and corn, B. F. Hardwick..... 146,251
Plow, winged, I. A. Benedict..... 146,225
Pocket book, safety, G. B. Clarke..... 146,232
Powder keg, N. Tenney..... 146,150
Press, wine and cider, H. N. Houghton..... 146,181
Propulsion, marine, J. S. Morton..... 146,266
Regulator, draft, J. M. Adolphus..... 146,221
Roadways, etc., snow from, C. G. Waterbury..... 146,219
Roofing, metallic, A. Gateau..... 146,130
Roofing tile, B. Mommenthy..... 146,140
Rubber and cloth roller, R. B. Huganin..... 146,255
Saddle attachment, gig, A. Gilliam..... 146,131
Safe, fur, R. H. Miller..... 146,139
Sash balance, J. J. Cowell, (r)..... 5,717
Sash fastener, J. G. Spatthelf..... 146,211
Sash pulley, M. Nelson..... 146,197
Saw mill, feed wheel for, J. Kerr..... 146,186
Scraper, foot, N. C. Burnap..... 146,228
Screw cutting machine, L. W. Stockwell..... 146,290
Separator, ore, J. Collom..... 146,168
Sewing machine, T. K. Reed..... 146,289
Sewing machine caster, J. A. Stansbury..... 146,289
Sewing machine cover, W. C. Wendell..... 146,293
Sewing machine water motor, O. J. Backus..... 146,230
Shaft tug, J. V. Ragon..... 146,203
Shirt, under, O. P. Flynt..... 146,175
Shovel, fire, Dodge & Ellis..... 146,172
Sign, alterable, L. Nieldner..... 146,268
Soda water apparatus, J. W. Tufts..... 146,294
Sower, guano, C. Smallwood..... 146,288
Sower, seed, J. B. Nixon..... 146,158
Spindle step, B. H. Jenks..... 146,181
Spinning machine bolster, Follett & Potter..... 146,241
Spinning machine, S. K. Smith..... 146,210
Spring, suspender, G. K. Wingfield..... 146,155
Stereoscope, revolving, J. W. Cadwell..... 146,161
Stereotype block holder, J. Bryson..... 146,163
Stone, dressing, G. W. Weatherhogg..... 146,297
Stove, portable, F. A. Schroeder..... 146,283
Suspender spring, G. K. Wingfield..... 146,155
Swing bar, adjustable, Cameron & Talbert..... 146,229
Tablet, drawing, M. Willson..... 146,200
Thill coupling, E. P. Conrick..... 146,214
Tool handle, W. H. McCoy..... 146,283
Toy, G. B. Adams..... 146,157
Tracefastener, Rombaugh & Mears..... 146,206
Transplanter, F. B. Abbott..... 146,156
Trap, animal, C. Schweizer..... 146,281
Trap, fly, McCreary & Crist..... 146,194
Twine holder, Huntley & Esty..... 146,256
Valve, steam regulating, J. E. Watts..... 146,153
Vehicles, wheel for, F. H. Brinkkotter..... 146,162
Vehicles, wheel for, W. Corris..... 146,234
Vehicles, wheel for, C. H. Guard..... 146,250
Vehicles, wheel for, C. B. Wainwright..... 146,295
Velocipede, G. Avery..... 146,159
Washer, ore, E. Paul..... 146,275
Washer or buddle, ore, J. Collom..... 146,166
Washing machine, D. W. Linn..... 146,135
Washing machine, F. E. Smith..... 146,209
Waterwheel, turbine, M. W. Obenchain & Co., (r)..... 5,724
Windlass and crank brake, H. M. Howard..... 146,182
Wind wheel, A. T. Page..... 146,200
Wrench, H. P. Hood..... 146,251
Zinc from fumes, recovering, H. Steger..... 146,286

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:

27,731.—CLOTHES WRINGER.—E. Dickerman. March 25.
27,821.—EXTENSION LADDER.—G. B. Mickle. March 25.
27,832.—HARVESTER.—L. C. Reese. March 25.
27,839.—SWEEPING MACHINE.—R. A. Smith. March 25.
27,846.—BELTING.—H. Underwood. March 25.
27,852.—HARVESTING MACHINE.—B. F. Witt. March 25.
27,855.—NIGHT LIGHT REFLECTOR.—J. Wyberd. March 25.
27,860.—LOOM.—J. C. Cooke. March 25.
27,866.—COTTON BALE TIE.—J. McMurtry. March 25.
28,105.—FRUIT BASKET.—J. K. Park. April 15.
28,175.—SCABBARD FRIG.—W. Hoffman. April 22.
28,483.—RATTAN MACHINE.—L. Hull. May 13.

EXTENSIONS GRANTED.

26,735.—WASTE COCK.—G. W. Robertson.
26,822.—TENON CUTTING TOOL.—L. A. Dole.

DESIGNS PATENTED.

7,081.—STAND AND BRACKET MATS.—L. Bushnell, New Bedford, Mass.
7,084.—CHILDREN'S CARRIAGES.—J. L. Brown, Boston, Mass.
7,085 to 7,092.—CARPETS.—R. R. Campbell, Lowell, Mass.
7,093.—KNOB AND ROSE.—W. Gorman, New Britain, Conn.
7,094 to 7,096.—CARPETS.—A. Heald, Philadelphia, Pa.
7,097.—TEA CANISTER.—E. Huntington, New York city.
7,099.—CARPET.—C. S. Lilly, Lowell, Mass.
7,099.—CARPET.—D. McNair, Lowell, Mass.
7,103.—HANDLE SOCKET.—J. S. Ray, East Haddam, Conn.
7,104 to 7,107.—TYPES.—R. Smith, Philadelphia, Pa.
7,103.—HANDLE SOCKET.—W. M. Smith, West Meriden, Ct.

TRADE MARKS REGISTERED.

1,591.—GAGE TUBES.—E. H. Ashcroft, Boston, Mass.
1,592.—WHISKY.—Kryder & Co., Philadelphia, Pa.
1,593.—SHOES.—T. C. Wales & Co., Boston, Mass.
1,594.—SAWS.—Wheeler & Co., Middletown, N. Y.

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

[Specially reported for the Scientific American.]

CANADIAN PATENTS.

LIST OF PATENTS GRANTED IN CANADA,
JANUARY 13 TO JANUARY 20, 1873.

2,997.—T. Piper, Hamilton, Ontario. Improvements on treadles for sewing machines, called "Piper's Improved Spring Clutch for Sewing Machines." Jan. 13, 1874.
2,998.—I. Grant, Shubenacadie, Hants county, Nova Scotia. Improvements in machine for cleaning tracks from snow, called "Grant's Snow Plow." Jan. 13, 1874.
2,999.—W. W. Byan, S. Grose and M. Harper, all of Whitby, Ontario county, Ontario. Machine for manufacturing the slats of door and window weather blind rolling slats with metal clip bearings, called "Byan's Blind Slat Machine." Jan. 13, 1874.
3,000.—W. W. Byan, S. Grose and M. Harper, all of Whitby, Ontario county, Ontario. Improvements on window and door weather blinds, called "Byan's Improved Venetian Blind." Jan. 13, 1874.
3,001.—T. Ney, Glenallen, Wellington county, Ontario, assignee of J. Small, of same place. Improvements on horse pokes, called "Ney's Improved Dexter Horse Poke." Jan. 13, 1874.
3,002.—W. Sellers, Haverhill, Essex county, Ontario. Improvements on lawn mowers, called "Sellers' Lawn Mower." Jan. 13, 1874.
3,003.—A. Rodgers, Muskegon, Muskegon county, Mich., U. S. Improvements on machine for sawing laths. Jan. 13, 1874.
3,004.—A. Rodgers, Muskegon, Muskegon county, Mich., U. S. Improvements in balance cranks, called "Rodgers' Balance Crank." Jan. 13, 1874.
3,005.—A. Rodgers, Muskegon, Muskegon county, Mich., U. S. Machine for canting logs, called "Rodgers' Log Canting Machine." Jan. 13, 1874.
3,006.—I. S. Adams, West Roxbury, Norfolk county, Mass., U. S. assignee of I. Colcott, of same place. Improvements on kaleidoscopes, called "The Adams' Automatic Kaleidoscopes." Jan. 13, 1874.
3,007.—M. Hine and H. P. Dibble, New Haven, New Haven, Conn., U. S. Improvements on machine for threading bolts, called "Hine and Dibble's Bolt Threading." Jan. 13, 1874.
3,008.—T. F. Conklin, Fond du Lac, Fond du Lac county, Wis., U. S. Improvements on the construction of smokestacks of locomotive engines and other engines, called "Conklin's Fuel Economizer and Spark Arrestor." Jan. 13, 1874.
3,009.—I. Parkyn, Montreal, P. Q. Manufacture of bran for transportation, storage, etc., called "Parkyn's Compressed Bran." Jan. 13, 1874.
3,010.—D. T. Casement, Painesville, Lake county, O., U. S. Improvements on pressure regulator for fluids, called "Casement's Pressure Regulator for Fluids." Jan. 13, 1874.
3,011.—S. McGee, Madison, Morris county, N. J., U. S. Improvement on oil preserving nave on box for axles in combination with his improved axle to be used in metallic hubs or bearings, called "McGee's Hub for Vehicles." Jan. 13, 1874.
3,012.—J. Hally, Valleyfield, Beauharnois, P. Q. Apparatus for the excavation of peat, called "The Ironclad Peat Excavator." Jan. 13, 1874.
3,013.—F. Culhan, Widder Station, Bosanquet, Lambton county, Ontario. Improvements on machinery for operating semaphore signals, called "Culhan's Patent Semaphore Signal." Jan. 13, 1874.
3,014.—B. Barter, Faribault, Rice county, Minn., U. S. Improvements on machine for dressing flour, called "Barter's Flour Dressing Machine." Jan. 20, 1874.
3,015.—J. Davis, J. Armstrong and D. Davis, all of Pittston, Luzerne county, Pa. Improvements on process for tanning, called "Davis and Armstrong's Tanning Process." Jan. 20, 1874.
3,016.—E. E. Brewer, Douglas, York county, Ontario. Improvements in churns, called "Favorite Churn." Jan. 20, 1874.

3,017.—J. Slater and H. S. Blatt, Sandy Lake, Mercer county, Pa., U. S. Improvements on sited brakes, called "Slater's Sled Brake." Jan. 20, 1874.
3,018.—A. D. McMaster, Rochester, Monroe county, N. Y., U. S. Improvements on stove boards, called "McMaster's Improved Stove Board." Jan. 20, 1874.
3,019.—W. H. Rogers, New London, Conn., U. S., and D. L. Caven, Stratford, Ontario. Combined check nut, called "Roger's and Caven's Combined Check Nut." Jan. 20, 1874.
3,020.—W. Wilson, Hamilton, Ontario. Improvement in railway switches, called "Wilson's Safety Railway Switch." Jan. 20, 1874.
3,021.—N. Johnson, Jasper, Steuben county, N. Y., U. S. Improvements in insertable saw teeth, called "Johnson's Insertable Saw Teeth." Jan. 20, 1874.
3,022.—C. Kinney, London, Ontario. Improvements on nut lock, called "Kinney's Lock Nut." Jan. 20, 1874.
3,023.—R. Elmsley, Toronto, Ontario. Indicator for registering the time occupied in playing games upon billiard tables, called "Elmsley's Billiard Marker." Jan. 20, 1874.
3,024.—D. T. Casement, Painesville, Lake county, O., U. S. Improvements on a method of burning fuel and generating steam, called "Casement's Method of Burning Fuel and Generating Steam." Jan. 20, 1874.
3,025.—J. W. Bookwalter, Springfield, Clark county, O., U. S. Improvements on steam generators, called "Bookwalter's Steam Generator." Jan. 20, 1874.
3,026.—L. Cote, St. Hyacinthe, P. Q. Improvements on a machine for forming boot and shoe stiffeners, called "Cote's Rotary Machine for Shaping Stiffeners." Jan. 20, 1874.
3,027.—F. H. Whitman, Harrison, Cumberland county, Me., U. S., assignee of E. H. Woods, South Boston, Mass., U. S. Improved block fitting machine, called "Woods' Block Fitting Machine." Jan. 20, 1874.
3,028.—J. Hewitt, Grimsby, Lincoln county, Ontario. Improvements on sad and fluting iron, called "Queen Iron." Jan. 20, 1874.
3,029.—I. Hewitt, Grimsby, Lincoln county, Ontario. Improvements on fluting plates, called "Universal Iron." Jan. 20, 1874.
3,030.—I. Hewitt, Grimsby, Lincoln county, Ontario. Improvements on glossing and fluting iron, called "Home Iron." Jan. 20, 1874.
3,031.—H. Frank, Pittsburgh, Allegheny county, Pa., U. S. Improvement on regenerative gas furnaces, called "Frank's Regenerative Furnaces." Jan. 20, 1874.
3,032.—H. Frank, Pittsburgh, Allegheny county, Pa., U. S. Improvements on tile for constructing furnaces, called "Frank's Furnace Brick." Jan. 20, 1874.
3,033.—H. Frank, Pittsburgh, Allegheny county, Pa., U. S. Improvements on hot blast ovens, called "Frank's Hot Blast." Jan. 20, 1874.
3,034.—I. P. Magoon and H. Fairbanks, St. Johnsbury, Caledonia county, Vt., U. S. Improvements on locomotive feed water heater, called "Magoon's Improved Locomotive Feed Water Heater." Jan. 20, 1874.
3,035.—J. West and O. M. Parker, Creston, Union county, Iowa, U. S. Improvement on steam bell ringers, called "West's and Parker's Steam Bell Ringer." Jan. 20, 1874.
3,036.—E. R. Whitney, Bolton, Broome county, P. Q. Improvement on veneer cutting machine, called "Whitney's Improved Veneer Cutter." Jan. 20, 1874.
3,037.—E. R. Whitney, Bolton, Broome county, P. Q. Improvements on printing types or blocks, called "Whitney's Glass Type." Jan. 20, 1874.
3,038.—J. McCullum, Nepean, Carleton county, Ontario. Improvement on potato diggers, called "McCullum's Improved Potato Digger." Jan. 20, 1874.
3,039.—W. S. Hunter and C. C. Colby, Stanstead, Stanstead county, P. Q. Improvement on the manufacture of paper, called "Hunter's Fabricated Paper." Jan. 20, 1874.
3,040.—L. Scofield and J. B. Walt, Grand Haven, Ottawa county, Michigan, U. S. Improvement on ironing tables, called "Scofield's Ironing Table." Jan. 20, 1874.
3,041.—J. W. Whitney, Cleveland, Cayuga county, O., U. S. Improvement on shoulder braces and suspenders combined, called "Whitney's Shoulder Brace and Suspender Combined." Jan. 20, 1874.
3,042.—I. Hewitt, Grimsby, Lincoln county, Ontario. Improvements on smoothing band, glossing and fluting iron, called "King Iron." Jan. 20, 1874.
3,043.—I. Lyons, Chippawa, Welland county, Ontario. Improvements in metal plates for wearing on the heels of boots and shoes, called "Lyons' Reversible Heel Plate." Jan. 20, 1874.
3,044.—J. Morris, Liverpool, England. Improvements on machines for finishing printed sheets of paper, called "Morris' Printers' Finishing Machine." Jan. 20, 1874.
3,045.—W. Corris, Rochester, Monroe county, N. Y., U. S. Improvements on carriage hubs, called "Corris' Improved Carriage Hub." Jan. 20, 1874.
3,046.—C. Wolf, Rochester, Monroe county, N. Y., U. S. Improvements on bedstead fastenings, called "Wolf's Improved Bedstead Fastening." Jan. 20, 1874.
3,047.—P. Huernie, San Francisco, San Francisco county, Cal., U. S. Improvement on a Water Filter, called "Huernie's Water Filter." Jan. 20, 1874.
3,048.—P. Bruce, Aurora, York county, Ontario. Improvement in the construction of buildings, called "Bruce's Improved Construction of Buildings." Jan. 20, 1874.
3,049.—J. J. Howell, Brantford, Ontario. Improvement on outside shutter hinge, called "Howell's Outside Shutter Hinge." Jan. 21, 1874.
3,050.—N. Clement, dit La Riviere, Montreal. Ameliorations aux ferrures pour pendre les portes de chars, called "Ferrures Ameliores de Noel Clement, dit La Riviere pour Portes de Chars." Improvements in iron fixtures for hanging doors to cars, called "Noel Clement dit La Riviere's Fixtures for Hanging Doors to Cars." Jan. 21, 1874.
3,051.—E. A. Goodes, Philadelphia, Pa., U. S. Improvements on sewing machines, called "The Goodes' Fancy Stitch Sewing Machine." Jan. 21, 1874.
3,052.—L. S. Johnson & M. G. Johnson, Cortland, Cortland county, N. Y., U. S. Improvements on articles of food, to wit: the preparation of beef for table use, called "Johnson's Beef Compound." Jan. 21, 1874.
3,053.—E. P. Richardson, Lawrence, Essex county, Mass. Improvement in machine for sewing hose, called "Richardson's Improved Machine for Sewing Hose." Jan. 21, 1874.

HOW TO OBTAIN
Patents and Caveats
IN CANADA.

PATENTS are now granted to inventors in Canada, without distinction as to the nationality of the applicant. The proceedings to obtain patents in Canada are nearly the same as in the United States. The applicant is required to fur-

nish a model, with specification and drawings in duplicate. It is also necessary for him to sign and make affidavit to the originality of the invention.

The total expense, in ordinary cases, to apply for a Canadian patent, is \$25, U. S. currency. This includes the government fees for the first five years, and also our (Munn & Co.) charges for preparing drawings, specifications and papers, and attending to the entire business. The holder of the patent is entitled to two extensions of the patent, each for five years, making fifteen years in all.

If the inventor assigns the patent, the assignee enjoys all the rights of the inventor.

A small working model must be furnished, made to any convenient scale. The dimensions of the model should not exceed twelve inches.

If the invention consists of a composition of matter, samples of the composition, and also of the several ingredients, must be furnished.

Persons who desire to apply for patents in Canada are requested to send to us (Munn & Co.), or express, a model with a description in their own language, showing the merits and operation of the invention, remitting also the fees as above for such term for the patent as they may elect. We will then immediately prepare the drawings and specification, and send the latter to the applicant for his examination, signature, and affidavit. It requires from four to twelve weeks' time, after completion of the papers, to obtain the decision of the Canadian Patent Office. Remit the fees by check, draft, or Postal order. Do not send the money in the box with model. Give us your name in full, middle name included. Inventions that have already been patented in the United States for not more than one year may also be patented in Canada.

On filing an application for a Canadian patent, the Commissioner causes an examination as to the novelty and utility of the invention. If found lacking in either of these particulars, the application will be rejected, in which case no portion of the fees paid will be returned to the applicant.

Inventors may temporarily secure their improvements in Canada by filing caveats; expense thereof, \$35 in full.

For further information about Canadian patents, assignments, etc., address

MUNN & CO.,
37 Park Row,
New York

VALUE OF PATENTS,
And How to Obtain Them.

Practical Hints to Inventors.

PROBABLY no investment of a small sum of money brings a greater return than the expense incurred in obtaining a patent, even when the invention is but a small one. Large inventions are found to pay correspondingly well. The names of Blanchard, Morse, Bigelow, Colt, Ericsson, Howe, McCormick, Hoe and others, who have amassed immense fortunes from their inventions, are well known. And there are thousands of others who have realized large sums from their patents.

More than FIFTY THOUSAND inventors have availed themselves of the services of MUNN & Co. during the TWENTY-SIX years they have acted as solicitors and Publishers of the SCIENTIFIC AMERICAN. They stand at the head in this class of business; and their large corps of assistants, mostly selected from the ranks of the Patent Office, men capable of rendering the best service to the inventor, from the experience practically obtained while examiners in the Patent Office; enables MUNN & Co. to do everything appertaining to patents BETTER and CHEAPER than any other reliable agency.

HOW TO OBTAIN PATENTS

This is the closing inquiry in nearly every letter, describing some invention which comes to this office. A positive answer can only be had by presenting a complete application for a patent to the Commissioner of Patents. An application consists of a Model, Drawings, Petition, Oath, and full Specification. Various official rules and formalities must also be observed. The efforts of the inventor to do all this business himself are generally without success. After great perplexity and delay, he is usually glad to seek the aid of persons experienced in patent business, and have all the work done over again. The best plan is to solicit proper advice at the beginning. If the parties consulted are honorable men, the inventor may safely confide his ideas to them; they will advise whether the improvement is probably patentable, and will give him all the directions needful to protect his rights.

To Make an Application for a Patent.

The applicant for a patent should furnish a model of his invention if susceptible of one, although sometimes it may be dispensed with; or, if the invention be a chemical production, he must furnish samples of the ingredients of which his composition consists. These should be securely packed, the inventor's name marked on them and sent by express, prepaid. Small models, from a distance, can often be sent cheaper by mail. The safest way to remit money is by a draft or postal order, on New York, payable to the order of MUNN & Co. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents.

Foreign Patents.

The population of Great Britain is 31,000,000; of France, 37,000,000; Belgium, 5,000,000; Austria, 36,000,000; Prussia, 40,000,000; and Russia, 70,000,000. Patents may be secured by American citizens in all of these countries. Now is the time, when business is dull at home, to take advantage of these immense foreign fields. Mechanical improvements of all kinds are always in demand in Europe. There will never be a better time than the present to take patents abroad. We have reliable business connections with the principal capitals of Europe. A large share of all the patents secured in foreign countries by Americans are obtained through our Agency. Address MUNN & Co., 37 Park Row, New York. Circulars with full information on foreign patents, furnished free.

Caveats.

Persons desiring to file a caveat can have the papers prepared in the shortest time, by sending a sketch and description of the invention. The Government fee for a caveat is \$10. A pamphlet of advice regarding applications for patents and caveats is furnished gratis, on application by mail. Address MUNN & Co. 37 Park Row, New York.

Value of Extended Patents.

Did patentees realize the fact that their inventions are likely to be more productive of profit during the seven years of extension than the first full term for which their patents were granted, we think more would avail themselves of the extension privilege. Patents granted prior to 1851 may be extended for seven years, for the benefit of the inventor, or of his heirs in case of the decease of the inventor, by due application to the Patent Office, ninety days before the termination of the patent. The extended time inures to the benefit of the inventor, the assignees under the first term having no rights under the extension except by special agreement. The Government fee for an extension is \$100, and it is necessary that good professional service be obtained to conduct the business before the Patent Office. Full information as to extensions may be had by addressing MUNN & Co. 37 Park Row, New York.

Trademarks.

Any person or firm domiciled in the United States, or any firm or corporation residing in any foreign country where similar privileges are extended to citizens of the United States, may register their designs and obtain protection. This is very important to manufacturers in this country, and equally so to foreigners. For full particulars address MUNN & Co. 37 Park Row, New York.

Design Patents.

Foreign designers and manufacturers, who send goods to this country, may secure patents here upon their new patterns, and thus prevent others from fabricating or selling the same goods in this market.

A patent for a design may be granted to any person whether citizen or alien, for any new and original design for a manufacture, built, statue, or alto relieve, or for relief, any new and original design for the printing of woolen silk, cotton, or other fabrics, any new and original impression, ornament, pattern, print, or picture, to be printed, painted, cast, or otherwise placed on or worked into any article of manufacture.

Design patents are equally as important to citizens as to foreigners. For full particulars send for pamphlet to MUNN & Co. 37 Park Row, New York.

Copies of Patents.

Persons desiring any patent issued from 1836 to November 26, 1867, can be supplied with official copies at a reasonable cost, the price depending upon the extent of drawings and length of specification.

Any patent issued since November 27, 1867, at which time the Patent Office commenced printing the drawings and specifications, may be had by remitting to this office \$1.

A copy of the claims of any patent issued since 1836 will be furnished for \$1.

When ordering copies, please to remit for the same as above, and state name of patentee, title of invention, and date of patent. Address MUNN & Co., Patent Solicitors, 37 Park Row, New York.

MUNN & Co. will be happy to see inventors in person at their office, or to advise them by letter. In all cases they may expect an honest opinion. For such consultations, opinions, and advice, no charge is made. Write plain; do not use pencil or pale ink; be brief.

All business committed to our care, and all consultations, are kept secret and strictly confidential.

In all matters pertaining to patents, such as conducting interferences, procuring extensions, drawing assignments, examinations into the validity of patents, etc., special care and attention is given. For information and for pamphlets of instruction and advice,

Address

MUNN & CO.,

PUBLISHERS SCIENTIFIC AMERICAN,

37 Park Row, New York.

OFFICE IN WASHINGTON—Corner F and 7th Streets, opposite Patent Office.

Advertisements.

Back Page - - - - - \$1.00 a line.
Inside Page - - - - - 75 cents a line.
Engravings may head advertisements at the same rate per line, by measurement, as the letter press. Advertisements must be received at publication office as early as Friday morning to appear in next issue.

LATHE & MORSE TOOL CO.,
Manufacturers of
MACHINISTS' TOOLS
Worcester, Mass.
Established 1853. Send for Illustrated Catalogue.

The Welch WATER ENGINE
This is the best for Sewing Machines, Lathes, Planes, and all other work. A practical and perfect tool. Send for Circulars. Address: N. E. M. & Co., Danbury, Conn.

TO CAPITALISTS AND MECHANICS.

We offer, for sale, a part interest in the Jefferson City Iron Works, located at Jefferson City, Mo. Works now within past three years. Capacity sufficient for 100 men with a well established trade, equal to full capacity of works. The goods made consist in part of THE HUB-BAR REAPER & MOWER, THE MISSOURI GRAIN PAIL, or SELF-DUMPING SICKLE, RAKE, and full line of COOKING and HEATING STOVE, and a large JOBBER and REPAIR trade, St. Louis, 25 miles East, being our nearest competitor. Will sell a third or a half interest, or make a Stock Co., and sell to good men such amount as desired. Parties who desire to invest in manufacturing in the West will rarely have such a favorable opportunity for profit. Remains LIBERAL. DIVIDENDS GUARANTEED. Reason for selling, want of Capital to push business equal to demand. Address: BROWN & LOHMAN, Jefferson City, Mo.

ORIGINAL
Schaeffer & Budenberg,
Magdeburg, Germany, Steam, Gas, and Hydraulic Engines and Engines of all kinds.
W. HEERMANN,
1 Cedar St., N. Y., Sole Depot.

\$72 EACH WEEK. Agents wanted, particularly J. WORTH & CO., St. Louis, Mo.

Genuine Chester Emery
Emery will be reduced in price, or sold at a low price, for a few days only. Address: E. N. HAUGHTON & CO., 21 Park Place, New York.

MONEY AWARDS—To all having space to fill, at \$10 a day, for the next week, for a valuable prize. Send for rules, home or abroad, day or evening; this is the best opportunity. Particulars and samples (valued worth \$10) free. Address: F. M. BIRD, 158 6th St., New York.

ADVERTISERS should send to Mun & Co., 37 Park Row, N. Y., for their *Eighty-page Pamphlet* containing lists of 300 new papers and estimates, showing the cost of advertising. Mailed free to all applicants.