

special combinations known to themselves only. The chilling is done by casting the metal in contact with an iron mould.

(24) C. H. S. asks: What is "rectified" whisky? Wherein does it differ from "distilled" whisky? Which is the purer and more costly and which is the more wholesome? A. Rectified whisky is generally passed over animal charcoal, while distilled whisky does not pass through this process. It is simply distilled directly from the mash. The distilled whisky is apt to be the cheapest, and as regard wholesomeness it is entirely dependent upon the quality.

(25) A. J. B. writes: How can I melt rubber? A. Heat the rubber by steam or over a water bath till the rubber melts, and let it run into hot water, where it will collect at the bottom of the vessel, while the vapor will prevent it from burning.

(26) I. N. G. writes: I have a private telephone line half a mile in length, using three of Bell's hand telephones without microphone or battery. I notice that in time of lightning it passes in on the wire sufficient to ring the bells at each station. I supposed it was owing to the heavy magnets in the signal bells, and I arranged a simple "cut out," by which the bells and telephone might be disconnected entirely in a moment, and thought that would leave the wire free from any attraction for lightning, but when all instruments are off, the lightning during rain storms will snap and crack from the ends of the wire inside as though it was a telegraph line heavily charged. Why is this, and is there any special danger or way to avoid it? A. You should provide a lightning arrester of approved form for each end of your telephone line. The magnets have little or nothing to do with the effects you mention. It is advisable to keep away from the telephone during a near thunderstorm.

(27) F. M. S. asks: I have a graphoscope lens 7 inches diameter, 40 inches focus; what sized lens would I require for eyepiece to make an achromatic telescope, and what should be the length of tube? A. Supposing that your graphoscopic lens is a single crown of good quality and accurate finish, you will need a concave flint lens about 3 inches diameter and 30 inches focus, placed about 25 inches from the object glass; this distance must be ascertained by trial, as the effect of the flint lens depends upon its dispersive power. The focus should be at from 50 to 60 inches. For the eyepiece use the Huyghens form, field glass 3 inches focus, plano convex; eye lens, 1 inch focus, plano convex.

(28) O. C. L. asks (1) how I can cheaply prepare the porous cells used in batteries? A. No porous cell is of much account unless made of clay and properly baked. You can purchase porous cells for a small sum, and it will not pay to try to make them. 2. Which would give the best current for the electric light—a chromic acid battery of M. Truque's solution and same construction, or one using porous cells, same size carbons and a like solution in porous cells? A. The battery without the porous cells is preferable for this purpose. 3. Taking the better one of the above batteries, how many would it require for one and two lights respectively, carbons 9x6x1/4? Would the effect for lighting purposes be increased by dividing the same amount of material and making a greater number of cells? A. All this depends on the kind of light you propose to make. A small incandescent light can be run with 4 or 5 such cells.

(29) J. A. C. asks: What size of reservoir at an elevation of 75 feet will produce a 6 horse power at a distance of 600 feet for twenty-four hours, and what size pipe to convey the water? A. You would require a reservoir 85 feet square, 16 feet deep, capable of holding 2,250 cubic feet of water, which will furnish you with 6 horse power for twenty-four hours without addition. Your pipe 600 feet long will require to be 4 inches in diameter with 75 feet fall.

(30) A. M. I. asks: Can you give me instructions how to make the simplest galvanic battery adapted for medical use? A. See article on galvanic batteries, SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 157, 158, and 159, for complete description of all sorts of batteries.

(31) E. M. B. asks what is the best non-conducting covering for steam pipes. A. The following table gives the results of a series of experiments by Mr. C. E. Emery, for the New York Steam Company:

Material.	Non-conductivity.
	Per cent.
Hair felt.....	100
Mineral wool No. 2.....	83.2
Mineral wool No. 2 and tar.....	71.5
Saw dust.....	68
Mineral wool No. 1.....	67.6
Charcoal.....	63.2
Pine wood, across grain.....	55.3
Loam.....	55
Gas works lime, slaked.....	48
Asbestos.....	36.3
Coal ashes.....	34.5
Fuel coke.....	27.7
Air space, 2 1/2" deep.....	13.6

(32) L. M. K. asks for a receipt for a cheap coating to put on cast iron that has to be submerged in water, that it may not rust or make the water taste. My pump is all cast iron, and if it is put in wells containing sulphur water it rusts very badly and spoils the water. A. There is probably nothing better than red oxide of iron or Prince's metallic paint and good boiled linseed oil, for iron work in water. Dry in an oven so as to make it hard, or a coat of good japan varnish stands well if baked hard. It is used on what is called enameled pipes for water. If the water has much sulphur, it will be difficult to thoroughly protect the iron.

(33) W. asks: Will you kindly inform me through your paper how I can clean the willow work on the baby carriages now so commonly used. After they have been used a short time they get sun burnt or soiled by the exposure to weather. A. If you are certain the soiling is not due to dirt from the atmosphere, etc., settling on the wood, then we recommend you to try some bleaching process. Either by using a chlorine bleach or burning sulphur in a closed chamber, or per-

haps by using hydrogen peroxide (SCIENTIFIC AMERICAN SUPPLEMENT No. 339). The size of the carriages is an objection, but we think that the only satisfactory process will be a bleaching one.

(34) E. T. S. writes: Please inform me through your paper where I can find a full description of the manufacture of turpentine and resin, from saw dust. A. The spirits of turpentine are made from the saw dust and refuse by a sweating process yielding 14 gallons of spirit, 3 to 4 gallons of resin and a quantity of tar per cord. The spirits obtained in this manner possess a different odor from those produced by distillation. The article on turpentine in Spence's Encyclopedia of the Industrial Arts, page 1686 et seq., will give some useful hints and descriptions of processes in use abroad.

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

C. P. C.—The samples sent are not at all characteristic and their identification is somewhat difficult. They appear to be as follows: No. 1 is a quartz mineral containing some flecks of black mica. No. 2 is a hornblende mineral with some pyroxene. No. 3. Hornblende with traces of pyrite. No. 4 is a silicious conglomerate. No. 5. Felspathic rock. No. 6 is a hornblende schist or slate. No. 7 is a mixture of different silicates, probably felspar and hornblende. No. 8 is a piece of hornblende rock.—J. S.—The sample is pyrite (iron sulphide), a mineral which usually carries gold, the amount of which can only be determined by a fire assay.—W. M.—This sample is a little below what is sold as second quality. Its value is dependent upon the supply. When the first quality is hard to procure, this variety will bring within 25 per cent. of the value of the better varieties. It sells at from 10 cents to \$3, according to the size of the sheets.—J. R. W.—The specimen is magnetite (iron oxide) and is a valuable ore of iron. The crystals resemble the ore which is mined at Port Henry, N. Y.—H. S.—No. 1 is a variety of hornblende called pearl stone. No. 2 is a silicious clay, a sort of conglomerate. It may carry metal, and therefore recommend you to have it assayed. No. 3. Yellow clay, too hard to grind cheap enough to compete with other varieties.—L. J.—The mineral is galena (lead sulphide). It may carry silver. This must be determined by assay.—W. C.—From a superficial examination of the sample, we are forced to conclude that it is inferior value.—F. C. Y.—The sample is a sulphide of iron, probably marcasite; it may carry gold. An assay would determine this.—J. D. M.—It is one of the uncrystallized varieties of quartz, probably jasper.—C. H. D.—The sample is pyrite (iron sulphide).

COMMUNICATIONS RECEIVED.

On Steam Boiler Furnaces. By J. M.
On Microscopes. By S. R. G.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

June 19, 1883,

AND EACH BEARING THAT DATE.

[See note at end of list about copies of these patents.]

Advertising card, H. H. Grace.....	279,866
Alarm. See Telegraph alarm.....	
Amalgam, retorting, C. A. Stetefeldt.....	279,840
AX and tool handle guard, G. P. Morrill.....	279,582
Bag. See Paper bag.....	
Bale bands or ties, cordage to be used for, S. Atkins.....	279,852
Bars, machine for bending and straightening, J. H. Wells.....	279,618
Battery. See Galvanic battery. Secondary electric battery.....	
Bearing, anti-frictional, T. R. Ferrall.....	279,552
Bed spring, J. O. Fiester.....	279,731
Bee hive, J. H. Burrage.....	279,856
Belt, electro galvanic, G. E. Palmer.....	279,881
Belt fastener, J. B. Conrad.....	279,716
Berths, governor for sawing, W. Wells.....	279,619
Blind, Venetian, J. S. Smith.....	279,935
Block. See Building block. Pulley block.....	
Board. See Telephone switch board.....	
Boat. See Dumping boat.....	
Boat knee socket, D. True (r).....	10345
Bobbin spindle and support therefor, J. E. Tynan.....	279,674
Boiler. See Coffee boiler.....	
Book holder, I. S. Mudgett.....	279,787
Boot or shoe, H. S. Cushman.....	279,859
Boot or shoe counters, machine for forming, L. Côté.....	279,717
Boot or shoe heel protector, H. K. Forbis.....	279,559
Bottle and jar stopper, N. Thompson.....	279,891
Bottle filling apparatus, J. D. Roberts.....	279,668
Bottle filling machine, E. L. Lloyd.....	279,776
Bottle stopper, E. L. Lloyd.....	279,777
Box. See Lunch box. Packing box. Paper box. Pepper and salt box. Service pipe box. Stuffing box.....	
Bracelet, Atwood & Lester.....	279,518
Brake. See Car hand brake. Wagon brake.....	
Bran or flour packer, H. G. Hall.....	279,746
Bran packer, J. E. Belt.....	279,854
Breastpin, ornamental, J. Hoagland.....	279,564
Brick, metallic pallet for, J. M. Blair.....	279,528
Bridle rosette, G. Walker.....	279,677
Brushes, machine for milling bone blanks for tooth, A. C. Estabrook.....	279,728
Building block or brick, J. L. Smithmeyer.....	279,836
Button fastener, F. D. Ford.....	279,560
Button, separable, T. Jarvis.....	279,568
Cake, device for ornamenting, A. J. Fish.....	279,555
Calipers, adjusting mechanism for, J. J. Byrne.....	279,534
Can, M. T. Barrows.....	279,521
Can, J. A. Frey.....	279,738
Cannon, breech loading, A. Dickerman.....	279,639
Car coupling, W. H. Heaverin.....	279,752
Car coupling, C. A. Huth.....	279,763
Car coupling, W. H. Lucan.....	279,654
Car coupling, D. C. McCallum.....	279,658
Car coupling, J. F. Pryor.....	279,800
Car coupling, B. F. Teal.....	279,614
Car coupling, S. G. A. Urquhart.....	279,675
Car coupling, J. D. Vance.....	279,845
Car door lock, J. H. Fisher.....	279,732
Car draft attachment, street, J. P. Messer.....	279,784
Car hand brake, T. Hunt.....	279,565
Car, railway, J. Parkinson.....	279,741

Car signal, revolving, Schoonover & Afferbach.....	279,821
Car wheel chime, J. N. Barr.....	279,520
Cars, device for unloading platform, G. P. Merrill.....	279,578
Cars, machine for unloading railway, A. Hall.....	279,868
Carriage iron, J. B. Birdsall.....	279,527
Carrier. See Cash carrier. Coal and ore carrier. Rein carrier. Shaft carrier.....	
Case. See Sewing machine case. Stamp case.....	
Cash carrier, G. A. Badger.....	279,688
Casket rest, J. Carroll.....	279,706
Chain cutter, F. L. Magaw.....	279,781
Chain or belt, driving, L. H. Goodwin.....	279,742
Chair. See Rocking chair.....	
Clamp. See Flanged clamp. Floor clamp. Sewing machine attachment clamp.....	
Clamp, E. Sage.....	279,501
Cleaner. See Cotton gin cleaner.....	
Clock, calendar, J. E. Young.....	279,850
Coal and ore carrier and transmitter, F. Murga-troyd.....	279,788
Coal crushing roller, J. H. & J. P. Hosie.....	279,761
Coal hod, C. Hoff.....	279,871
Cock, ball, J. Zane.....	279,685
Cock for engines, cylinder, J. B. Haight.....	279,562
Cock valve, water, F. W. Kelly.....	279,569
Coffee boiler, H. & J. Kassen.....	279,649
Coffee pot spouts, etc., machine for forming, G. R. Scates.....	279,602
Coking coal dust for manufacturing fuel and gas, J. W. Pittinos.....	279,796
Collar, J. M. Ide.....	279,567
Collar fastener, W. Hayton.....	279,751
Confectionery, P. Richter.....	279,812
Corking machine, F. G. Riley.....	279,813
Corn from the cob, machine for cutting green, J. A. Smith.....	279,833
Cotton gin cleaner and feeder combined, W. L. Crowson.....	279,720
Cotton picking machine, C. C. Price, Jr.....	279,799
Coupling. See Car coupling. Pipe coupling.....	
Crane, traveling, F. K. Kempton.....	279,765
Cream, apparatus for souring, Madsen & Nielsen.....	279,876
Cultivator, straddle row, F. Sheaffer.....	279,523
Curtain fixture, W. P. Putnam.....	279,801
Curtain fixture, W. P. & S. L. Putnam.....	279,803
Curtain ring, D. D. Nugent.....	279,385
Cushion. See Chain cutter. Feed cutter. Hog nose cutter.....	
Damper for furnace or stove pipes, N. A. Boynton.....	279,530
Dampers, apparatus for opening, J. H. Haldeman.....	279,867
Dental flask, F. W. Seabury.....	279,605
Disinfecting apparatus, Hadden & Wood.....	279,644
Disintegrating grain, etc., apparatus for, F. Taggart.....	279,842
Door hanger, W. F. Berry.....	279,526
Door hanger, E. L. Shaffner.....	279,606
Door hanger, J. D. Wilber.....	279,898
Double tree, O. Vanorman.....	279,846
Dredging and excavating machine, R. E. Rose.....	279,599
Dredging machine, elevator, J. Kennedy.....	279,570
Drier. See Fruit drier.....	
Drilling machine, J. C. Smith.....	279,834
Driving mechanisms, gallowframe for portable, W. T. Kellogg.....	279,650
Dumping boat or scow, J. W. Wilson.....	279,683
Dust pan, W. M. Valentine.....	279,676
Dye vat, machine for handling yarn in the, R. L. Rushlow.....	279,834
Electric arc lighting system, R. J. Sheehy.....	279,825
Electric circuit cut out, A. L. Bogart.....	279,634
Electric machines, combined current indicator and commutator adjuster for dynamo, R. J. Sheehy.....	279,826
Electrical conductors, underground system of laying, J. R. Hamilton.....	279,646
Electrical instrument protector, M. D. & T. A. Connolly.....	279,713
Electrical switch board plug, E. Flint, Jr.....	279,557
Elevator. See Hay elevator.....	
Elevator, S. W. Hoag, Sr.....	279,648
End gate, D. Arnold.....	279,687
Engine. See Gas engine. Pumping engine.....	
Envelope, P. L. Cuskey.....	279,543
Fan wheel, W. Schmolz.....	279,603
Feed cutter, H. A. Buck.....	279,533
Feed water heater, A. F. Ward.....	279,848
Fifth wheel, vehicle, C. Comstock.....	279,711
Fire escape, S. J. Anderson.....	279,628
Fire escape, W. F. Cullen.....	279,638
Fire escape, H. Greene.....	279,744
Fire escape, G. H. Hume.....	279,762
Fire escape, J. Letzkus.....	279,774
Fire escape, P. P. Ripley.....	279,814
Fire escape, E. Wilson.....	279,900
Fireproof garment, J. E. Smith.....	279,669
Fish trap, C. Fisher.....	279,556
Flanged clamp, E. S. Leaycraft.....	279,576
Flask. See Dental flask.....	
Floor clamp, S. Raymond.....	279,808
Flour packer, C. F. Walters.....	279,678
Flue stop, J. F. Lockwood.....	279,874
Fly wheels of engines, etc., device for turning, P. P. Kilcullen.....	279,652
Fruit drier, A. Crawford.....	279,719
Fruit drier, J. M. Teasdale.....	279,844
Fruit jar, H. Cain.....	279,535
Funnel, H. E. Gifford.....	279,739
Galvanic battery, Kauffer & Serson.....	279,872
Gas burner check, W. G. Pugh.....	279,595
Gas engine, H. S. Maxim.....	279,657
Gate. See End gate. Hatch gate. Hatchway gate. Railway stock gate. Safety gate.....	
Gate, B. Smith.....	279,832
Governor, marine engine, C. C. Dow.....	279,861
Grain binder, J. O. Lee.....	279,773
Grain cutting machine, H. E. Pryor.....	279,594
Grate, automatic adjustable, F. A. Knox.....	279,770
Grinding mill, U. H. Odell.....	279,880
Guard. See Railway safety guard. Spinning frame thread guard.....	
Gun, air, W. T. Chamberlain.....	279,538
Gun stock, S. N. Stevens.....	279,841
Guns and projectiles, charging, W. T. Chamberlain.....	279,540
Halter strap fastener, J. Gibbons.....	279,561
Hanger. See Door hanger. Shaft hanger.....	
Harness loop, J. S. Ginger.....	279,741
Harness loop, C. F. G. Stender.....	279,609
Harrow, J. Y. Payton.....	279,793
Harrow, wheel, T. A. Sweet.....	279,613
Harvester rake trip mechanism, W. F. Burditt.....	279,703
Hat, J. P. Beatty.....	279,699
Hat machines, movable bottom for, C. Lake.....	279,772
Hat or cap lining, C. Simis.....	279,830
Hat scalding and felting machine, J. S. Taylor.....	279,843
Hat sizing machine, A. Pelisse.....	279,664
Hatter's tank, R. Drake.....	279,547
Hatch, elevator, W. Stevens.....	279,612
Hatch gate, elevator, W. Stevens.....	279,611
Hatchway gate, W. Stevens.....	279,610
Hay and cotton press, S. Donaldson.....	279,546

Hay elevator and carrier, F. B. Strickler.....	279,889
Hay rake and loader, J. T. Hart.....	279,647
Heater. See Feed water heater.....	
Heating and lighting, hydrocarbon apparatus for, F. H. Holmes.....	279,760
Hinge, H. C. Lewis.....	279,775
Hinge, adjustable, M. Campbell.....	279,857
Hog nose cutter, W. B. Lyon.....	279,779
Hoisting apparatus, T. W. Capen.....	279,704
Holder. See Book holder. Parcel holder. Sad iron holder.....	
Horse power, W. B. Ingersoll.....	279,764
Horseshoe, adjustable, P. Hicks.....	279,758
Hub for couplings or pulleys, R. Whitehill.....	279,623
Hub, vehicle wheel, M. Tidd.....	279,892
Ice, apparatus for melting anchor, A. H. Martine.....	279,901
Ice scraper, L. Hallowell.....	279,645
Ice plow, C. R. Kyser.....	279,653
Inkstand, I. Brooke.....	279,532
Insulator, electrical, D. M. Steward (r).....	10,344
Iron. Carriage iron. Vehicle chafe iron.....	
Iron in the Bessemer basic process, obtaining purified, J. Reese.....	279,596
Jack. See Lifting jack. Screw jack.....	
Knife. See Mincing knife. Pocket knife.....	
Knife grinder and sharpener, horizontal, M. O. Millar.....	279,785
Ladder and fire escape, combined fireman's, Dempster & Horton.....	279,545
Ladder, flexible, V. Cravens.....	279,542
Ladder, step, J. N. Valley.....	279,893
Lamp, electric arc, H. Ansot.....	279,517
Lamp, electric arc, R. J. Sheehy.....	279,824
Lamp, incandescent, G. Richter.....	279,811
Latch, W. E. Sparks.....	279,837
Latch, door, E. N. Porter.....	279,797
Lathing, metal, A. R. Hancock.....	279,748
Leathersplitting machine, McDonald & Weggs.....	279,659
Lifter. See Transom lifter.....	
Lifting jack, E. D. Sloat.....	279,698
Link protector, A. V. Smith.....	279,831
Lock. See Car door lock. Satchel lock.....	
Log canter, G. Mee.....	279,660
Loom letting off motion, Williamson & Swindells.....	279,626
Loom picker staff check, J. S. Richardson.....	279,527
Lounges, adjustable leg for folding, A. S. Newby.....	279,789
Lounges, combined leg and clasp for folding, F. E. Campbell.....	279,536
Lubricator, C. F. Bowman.....	279,699
Lubricator, W. L. Parker.....	279,592
Lunch box, J. R. Olinger.....	279,662
Mandrel for bending tubes, E. S. Leaycraft.....	279,573
Mechanical movement, R. Larter.....	279,571
Mechanical movement, O. C. White.....	279,897
Mill. See Grinding mill. Roller grain mill. Saw mill.....	
Mincing knife, C. Gilberts.....	279,643
Moulder's jointless plate, W. S. Withers.....	279,627
Motion, device for converting, W. T. Kellogg.....	279,651
Motor. See Spring motor.....	
Music leaf turner, A. T. & D. T. Fox.....	279,737
Nail driving machine, E. Merritt.....	279,579
Napkin ring and menu holder, F. Ratcliff.....	279,805
Necktie fastener, G. W. Bowers.....	279,697
Needle for fancy work, J. S. Blinn.....	279,693
Oil, manufacture of linseed, H. A. Davidson.....	279,860
Ordnance, G. A. Cassagnes.....	279,636
Ore separator, dry, M. B. Dodge.....	279,640
Ore separator, wet, M. B. Dodge.....	279,641
Oyster dredge, E. Paterson.....	279,192
Packing box, sheet metal, L. D. Dozier.....	279,726
Packing case box, etc., W. C. Barker.....	279,689
Paddle wheel, feathering, L. C. Fogg.....	279,558
Painter's stripping device, W. A. Kibbe.....	279,767
Pan. See Dust pan.....	
Paper bag, J. P. Onderdonk.....	279,586
Paper bag, D. Heston.....	279,755
Paper box, Heston & Brown.....	279,757
Paper pulp, etc., mould for manufacturing stoppers and bungs from, Hemje & Brecht.....	279,869
Paperweight, E. F. Pfeuger.....	279,795
Parcel holder for elevated ways in stores, G. R. Elliott.....	279,727
Pavement foundation, Bryant & Tostevin.....	279,701
Pendulum, compensation, D. Shive.....	279,828
Pepper and salt box and napkin ring, combined, F. Ratcliff.....	279,806
Photographing changing or moving objects, method of and apparatus for, E. J. Muylbridge.....	279,878
Pincushion, F. Ratcliff.....	279,807
Pipe coupling, E. S. Leaycraft.....	279,575
Plaiting and scalloping device, combined, J. S. Sackett.....	279,820
Plane, bench, S. R. & A. E. Rust.....	279,885
Planter check rower, corn, L. D. Benner.....	279,692
Planter check rower, corn, F. B. Kendall.....	279,766
Planter, corn, L. Scofield.....	279,822
Planting machine, cane, C. C. Coleman.....	279,709

Sash fastener, J. H. Lacerte.....	279,771
Sash fastener, W. E. Sparks.....	279,838
Satchel lock, R. Flocke.....	279,738
Saw guide, R. F. Allen.....	279,515
Saw mill, Carter & Seely.....	279,537
Saw swage, M. Covell.....	279,718
Saw swage, S. Kinney.....	279,769
Saws cleansing, W. Bowker.....	279,698
Sawing machine, chain, F. L. Magaw.....	279,780
Scaffold, W. A. Gillett.....	279,740
Scule, beam, A. R. English.....	279,538
Scule, weighing, W. C. Farnum.....	279,864
Screen. See Window screen.....	
Screw jack, J. Heritage.....	279,753
Seaming irregular shaped cans, machine for, W. H. Atkinson.....	279,853
Seat. See Vehicle seat. Wire seat.....	
Secondary electric battery, E. T. Starr.....	279,839
Separator. See Ore separator.....	
Service pipe box, Cahill & Mangold.....	279,703
Sewing machine, R. Whitehill.....	279,621
Sewing machine attachment clamp, Angell & Spear.....	279,516
Sewing machine, button hole, Sullivan & Baker.....	279,890
Sewing machine button hole attachment, Hartley & Rodgers.....	279,563
Sewing machine case or cabinet, G. A. Lovell.....	279,875
Sewing machine, hat, W. F. Beardslee.....	279,523
Sewing machine needle clamp, M. W. Simkins.....	279,607
Sewing machine shuttle, R. Whitehill.....	279,625
Sewing machine stand and treadle, R. Whitehill.....	279,622
Sewing machine, straw braid, F. Blackburn.....	279,855
Shaft carrier, W. Royer.....	279,888
Shaft hanger, R. Whitehill.....	279,624
Sheep dip, P. M. Carpenter.....	279,705
Sheet metal cutting machine, Wilson & Boole.....	279,899
Shoes, device for marking the location of buttons for, J. H. Footens.....	279,735
Sifter, ash, U. E. Dodge.....	279,724
Signal. See Time signal.....	
Signal and messenger call box, district, E. W. Applegate.....	279,629
Sink trap, J. MacDonald.....	279,655
Slate, school, A. Maggio.....	279,656
Spindle. See Bobbin spindle.....	
Spindle bolster and step combined, T. Watson.....	279,680
Spinning and twisting machines, stop motion for, W. G. Hendee.....	279,870
Spinning frame thread guard, ring, J. E. Prest.....	279,798
Spinning machine, etc., T. Watson.....	279,681
Spittoon, C. Pucous.....	279,633
Spring. See Bed spring. Vehicle spring.....	
Spring motor, D. Shive.....	279,827
Stamp case and attachment, J. S. Miller.....	279,786
Stamp, dating, R. S. Robson.....	279,815
Stand and rack for exhibiting goods, A. Richards, Sr.....	279,812
Stay, garment, C. Erlanger.....	279,549
Stone, artificial, W. P. Rose.....	279,817
Stone for veneers, etc., artificial, W. Matt (r).....	10,341
Stopper. See Bottle and jar stopper.....	
Store service system, G. R. Elliott.....	279,862
Stove pipe section, C. P. Kramer.....	279,873
Stove shelf, L. A. White.....	279,620
Stuffing box or packing chamber, S. Fox.....	279,642
Sweeping apparatus, pneumatic, E. S. Leaycraft.....	279,572
Tank. See Hatter's tank.....	
Tap and faucet, Gregg & Briody.....	279,745
Tea kettle, E. M. Brewster.....	279,635
Telegraph alarm, printing, S. D. Field.....	279,730
Telegraph, printing, S. V. Essick.....	279,550
Telegraph, printing, S. D. Field.....	279,729
Telegraphic and telephonic instruments, projector for, M. D. Connolly.....	279,712
Telegraphic repeater, J. P. Smithers.....	279,670
Telephone switch board, E. B. Hamlin.....	279,747
Tent and bed combined, M. Perez.....	279,593
Thill, vehicle, A. Rasmussen.....	279,804
Thimble, M. Beatty.....	279,824
Thrashing machine, cutting and feeding attachment, D. Dowd.....	279,735
Tiling machine, C. E. Sackett.....	279,819
Time signal, Bound & Boone.....	279,696
Toe weight, D. Roherge.....	279,667
Tongue support, wagon, J. W. Wetmore.....	279,895
Toy, A. Green.....	279,743
Toy, bandoleer, Streisguth & Schultzer.....	279,888
Toy bedstead or crib, W. S. Reed.....	279,665
Toy, revolving air, T. W. Bartholomew.....	279,630
Transom lifter, R. J. Carson.....	279,838
Trap. See Fish trap. Sink trap.....	
Treadle, Lockwood & Orrill.....	279,577
Truck and bench, combined, N. H. Long.....	279,778
Tug, hame, A. L. Hill.....	279,759
Type writing machine, H. Orpen.....	279,790
Valve for compound engines, slide, E. G. Davis.....	279,544
Valve, piston, F. Stitzel.....	279,887
Valve, straightway, P. G. Van Wie.....	279,617
Vegetable slicer, S. R. Massari.....	279,782
Vehicle chafe iron, E. P. Roche.....	279,816
Vehicle seat, F. A. Comstock.....	279,637
Vehicle spring, D. Argerbright.....	279,686
Vehicle spring, McDaniel & Perrine.....	279,783
Vehicle, two wheeled, R. F. Briggs.....	279,531
Vehicle, two wheeled, Renick & Curtis.....	279,809
Vehicle, wheeled, W. Boyd.....	279,529
Velocipede, L. D. Cox.....	279,511
Vessels, construction of sea going, J. L. Eshelman.....	279,863
Wagon, base, A. W. Shue.....	279,829
Wagon, buckboard, O. Vanorman.....	279,894
Wall pocket, G. W. Hessler.....	279,754
Washing machine, Beam & Brillingen.....	279,522
Washing machine, C. Beidler.....	279,691
Washing machine, W. J. Forsyth.....	279,734
Washing machine, Morlan & McKeehen.....	279,877
Water closet, T. Hyde.....	279,566
Water heater and circulator boiler, T. G. Morse.....	279,583
Water wheel, turbine, C. Barnhart.....	279,519
Well point, drive, R. A. Ryrie.....	279,600
Wheel. See Fan wheel. Fifth wheel. Paddle wheel. Water wheel.....	
Wheels for vehicles, etc., making, Newlin & Whitehall.....	279,534
Wheelbarrow, W. Seabrook.....	279,604
Whip socket, S. J. Clark.....	279,708
Window screen, J. D. Palmer.....	279,882
Window screens, making, W. G. Anderson.....	279,851
Wire seat, woven, H. Roberts.....	279,598
Wire tyer, B. F. Bell.....	279,525
Wire, wire rods, etc., apparatus for annealing, cleaning, and galvanizing or plating, T. Midgley.....	279,580
Wrench, G. W. Davenport.....	279,722
Wrench, G. F. Newell.....	279,661
Wrench, H. Wheeler.....	279,896
Yoke, neck, H. R. Wallace.....	279,847

DESIGNS.

Badge or emblem, P. H. Rinn.....	13,992
Boot strap, H. C. Noble.....	13,985
Carpet, A. L. Halliday.....	13,997

Carpet, J. Nell.....	13,998
Carpet, P. Pignot.....	13,986 to 13,991
Dish, vegetable, D. Willets.....	13,985
Inkstand, L. B. Gray.....	13,986
Handle for table ware, W. B. Durgin.....	13,983
Post office lock box dog, W. H. Camp.....	13,982
Satchel, I. Wallach.....	13,994
Smoking pipe, H. Tibbe.....	13,999
Type ornaments, printing, H. H. Thorp.....	13,993
Watch cases, ornamentation of, V. Nivois.....	13,984

TRADE MARKS.

Axes, H. D. Loveland.....	10,358
Bleaching and dyeing compounds, Wilson Chemical Company.....	10,363
Canned fruits and vegetables, Reid, Murdoch & Fischer.....	10,359
Coloring matter, red, Levinstein, Campbell & Co.....	10,357
Dates, Gray, Dawes & Co.....	10,355
Hosiery, Hecker & Soehne.....	10,354
Knit woolen goods, fulled, C. E. Wakeman & Co.....	10,362
Oils, pigments, varnishes, driers, primers, and the like, R. M. Breinig.....	10,353
Remedy for catarrh, cold in the head and throat, H. F. Roberson.....	10,360
Remedy for kidney and urogenital diseases, E. H. Kaerocross.....	10,356
Thread, twine, and cord, Ross, Turner & Co.....	10,361

A printed copy of the specification and drawing of any patent in the foregoing list, also of any patent issued since 1866, will be furnished from this office for 25 cents. In ordering please state the number and date of the patent desired, and remit to Munn & Co., 261 Broadway, New York. We also furnish copies of patents granted prior to 1866; but at increased cost, as the specifications, not being printed, must be copied by hand.

Canadian Patents may now be obtained by the inventors for any of the inventions named in the foregoing list, at a cost of \$40 each. For full instructions address Munn & Co., 261 Broadway, New York. Other foreign patents may also be obtained.

Advertisements.

Inside Page, each insertion - - - 75 cents a line.
Back Page, each insertion - - - \$1.00 a line.
(About eight words to 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 Thursday morning to appear in next issue.

Curtis Pressure Regulator,
FOR STEAM AND WATER.
Is made entirely of Metal. Occupies the same space as a Globe Valve. It has no glands or packing, and is a lock-up valve.

CURTIS STEAM TRAP
Has main valve outside and air valve inside.

CURTIS REGULATOR CO.,
54 Beverly St., Boston, Mass.

\$5 to \$20 per day at home. Samples worth \$5 free.
Address Srinson & Co., Portland, Me.

NOW READY.—The Phonographic Dictionary.
By Benn Pitman and Jerome B. Howard. Price, \$2.50.
Sent for specimen sheets. Sold by all booksellers, or
Address PHONOGRAPHIC INSTITUTE, Cin. O.

OUR NEW CARDS. 1883.
50 Different Designs: Birds, Floral, Gold Panel, German, French, Italian and Oriental Views, summer, winter, moon, light and marine scenes, all in beautiful colors on superfine enameled board, with your name in fancy script type, 10c. A 30 page illustrated Premium List sent with each order. Agents make 50 per cent. Full particulars and samples for 3c. stamp.

CAXTON PRINTING CO., Northford, Conn.

MOULDS OF ALL DESCRIPTIONS, ORNAMENTAL and Plain Metal Patterns. Die Sinking, Model Making, &c. CHAS. A. BAILEY, Middletown, Conn.

SHEPARD'S CELEBRATED \$60
Screw Cutting Foot Lathe.
Foot and Power Lathes, Drill Presses, Scrolls, Saw Attachments, Chucks, Mandrels, Twist Drills, Dogs, Calipers, etc. Send for catalogue of outfits for amateurs or artisans. Address
H. L. SHEPARD & CO.,
341 & 343 West Front St., Cincinnati, O.

Patent For Sale. For Construction of Jails. See page 403. Either the whole patent or State rights. For terms, address SAM. M. McLEAN, Modesto, Cal.

An engine that works without Boiler. Always ready to be started and to give at once full power. **SAFETY, ECONOMY, CONVENIENCE.**
Burns common Gas and Air. No steam, no coal, no ashes, no fires, no danger, no extra insurance. Almost no attendance.

THE NEW OTTO SILENT GAS ENGINE.
Useful for all work of small stationary steam engine. Built in sizes of 2, 4, and 7 H. P., by SCHLEICHER, SCHUMM & CO., N. E. Cor. 3d & Walnut Sts., Phila. Pa. A. C. Manning, 33 Dey St., New York, Agent.

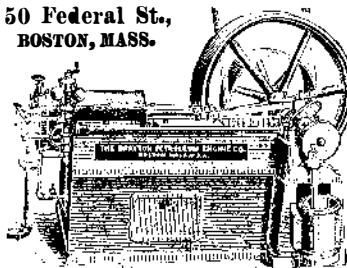
SCALY BOILERS made clean as new, safely and cheaply, by American Chemical Co., P. O. Box 348, Pittsburg, Pa. Send for Book.

EAGLE MACHINE COMPANY JOINT STOCK
Charlestown Mfg. Co., W. Va. Agricultural Implements. A general manufacture, just organized. Capital, \$100,000. Location, Great Shenandoah Valley on S. V. R. R. at Junction B. & O. R. R., direct to points East, North, South, West adjoining Maryland, Pennsylvania, Virginia. Material abundant, facilities unsurpassed. Wanted, experienced person, corresponding capital to embark. Address William H. Kebble, Charlestown Mfg. Co., W. Va.

Chandler's Ice Cutting Machine.
Indispensable for Family Use.
Made in 3 sizes; No. 1, for Bar tops, \$4; Nickel Plated, \$10; No. 2, for Family and Universal Use, \$6; Nickel Plated \$15; No. 3, for Hotels, Markets, Hospitals, &c. where crushed ice is needed in quantities, all galvanized iron, \$20. Capacity of No. 3 machine, a cake of ice weighing 25 lbs. at a time. Manufactured by
N. S. CHANDLER,
SPRINGFIELD, MASS.
To whom all orders should be addressed. Sent by express, prepaid, on receipt of price, or sent C. O. D., purchaser paying return charges.

The Brayton Petroleum Engine Co.

50 Federal St.,
BOSTON, MASS.



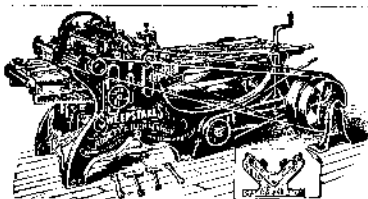
SAFETY! ECONOMY! CONVENIENCE!

Expense Ceases when Engine is Stopped.
While the cheapest motor in the world for continuous running, the cost of fuel becomes a mere trifle when power is required at intervals only.

J. R. SMITH.....Philadelphia, Pa.
G. S. WORMER & SONS.....Detroit, Mich.
T. S. WORMER & SONS.....Chicago, Ill.
S. S. BOWMAN.....St. Louis, Mo.
ROBINSON & CARY.....St. Paul, Minn.

PACKING BOX PATENTS FOR SALE.
(Numbers 276,356 and 258,373.) In nearly universal use in England. Bottles packed and unpacked instantaneously without skilled labor, without straw, and in perfect security. Great saving in time and in breakages. Address W. P. THOMPSON & CO., International Patent Brokers, 6 Lord Street, Liverpool, Eng.

\$66 a week in your own town. Terms and \$5 outfit free. Address H. HALLET & Co., Portland, Me.



SWEEPSTAKES, WITH THE ELLIS
Patent Journal Box. The best Planer and Matchever made. Planing 20 in. wide, 6 in. thick, weight 2,200 lb., \$300; planing 24 in. wide, 6 in. thick, weight 2,600 lb., \$350. Beading, Arbor and Head, extra, \$20. Sash, Door, and Blind Machinery a specialty. Correspondence solicited. Rowley & Hermance, Williamsport, Pa.

IRON-WORKING MACHINERY
A SPECIALTY
H.B. SMITH MACH. CO.
925 MARKET ST.
PHILADELPHIA.

U.S.A. MACHINERY.
ENGINES AND BOILERS. STEAM PUMPS AND SUPPLIES.

WRITE FOR ESTIMATES. Whole Outfits Furnished.

25 Imported design Chrono Cards for 1883, name on 10c. Quality not quantity. Warranted best sold. Bonanza for agents. FRED L. JONES, Nassau, N. Y.

HORSES.—THE FOLLOWING VALUABLE
papers are contained in the SCIENTIFIC AMERICAN SUPPLEMENT. Price 10 cents each, sent by mail to any address. To be had at this office or of newsdealers in all parts of the country. Please order by the numbers in large type, which indicate the number of the SUPPLEMENT in which the article is contained.

Evolution of the American Trotting Horse. By Prof. W. H. Brewer. A valuable paper, showing the gradual development of the trotting quality from year to year in the past, the annual gains in speed, with tables and suggestions as to future speed. 356. The Fastest Records. Being a table of the best trotting time on record at all distances and all ways of going, from 1830 to and including 1882, embracing Trotting in Harness, Trotting to Wagon, Trotting to Double Teams, Trotting under Saddle, and Pacing. 374. Horses' Legs. Seven illustrations showing the forms of sound and unsound legs, malformations, etc. 193. Breaking Horses by Electricity. Engraving. 208. Polydactyl Horses. Recent and Extinct. Illustrations. By Prof. O. C. Marsh. 188. History of the Horse Botfly. By Dr. N. Joly. With thirty-four figures. 212. On the Care of Horses. 123. 185. Specification of the Points of a Good Horse. 183. Portable Food for Horses—How to Make. 95. Best Mode of Feeding Farm Horses. 2. The Perfect Horse and how to Measure Him. With engraving. 29. Peculiarities in Structure of the Horse. By Prof. Huxley. 44. Value of Carrots for Horses. 45. Calculus in Horses. Mash for. 53. How to Treat the Teeth of Horses—Dentistry. 88.

Points of Celebrated Horses. Sefton. Winner of the Derby. 134. Sir Berrys and Wheel of Fortune. Winners of the Derby. 185. Ironopolis, Winner of the Derby. 290. Luke Blackburn. 269. Don Cossack. Four Year Old Stallion. 273. Blair Athol, the Most Valuable Horse ever known. 355. English Cart Horses. Illustrated. 277. 325.
On Scientific Breeding. By D. C. Caton. A valuable paper relating to the breeding of horses and other animals. 273. The Horse and His Fossil Ancestry. 353. Science of the Horse's Motions. Illustrated. 346. Proportions, Conformations, and Terms Generally Given to the Horse. With measurements and illustrations. 225. How to Tell a Horse's Age. 217. Treatment of Horses' Legs. 224. The Percheron Horse. 346. A Horseholder's Experience—Valuable Hints. 233. Horse Clipping. defense of. 311; Kind Treatment of. 303. Floors for Horse Stables. 308. The American Horse. By E. L. Berthoud. 311. On Saddle Horses. By Alexander. 291. Trotting Statistics. Being an alphabetical list of Trotting Horses, from 1868 to and including 1882, that have won races in which the purses stakes, or premiums exceeded \$10,000; with description, sire, date of career, best record, number of races won, and amount of purse. A valuable paper for reference. 377. The Art of Horsehoisting: Its Earliest History and Principles. By Prof. Maurice Kell. A valuable and useful paper. 378. Educated Horses in London. One page of engravings. 386.

MALLEABLE AND FINE GRAY IRON ALSO STEEL CASTINGS FROM SPECIAL PATTERNS.
THOMAS DEVLIN & CO.
FINE TURNING JAPANNING AND GILDING
LEHIGH AVE. & AMERICAN ST. PHILA.

\$72 A WEEK, \$12 a day at home easily made. Costly Outfit free. Address Trux & Co., Augusta, Me.

To Electro-Platers.

THE VICTOR DYNAMO PLATING MACHINES.
Three sizes, \$40, \$60, and \$80. Also Batteries and material for Gold, Silver, and Nickel Plating.
THOMAS HALL, 19 Bromfield St., Boston, Mass.
Send for Illustrated Catalogue.

50 All New Enameled Gold and Floral Chromo Cards, name on 10c. W. H. Card Works, West Haven, Ct.

PECK'S PAT. DROP PRESS.
NEW HAVEN CONN.

AGENTS Wanted for handsome illustrated standard works of character, great variety, and low price; selling fast; needed everywhere; Liberal terms. Bradley, Carleton & Co., 66 N. Fourth St., Philadelphia, Pa.

GET THE BEST AND CHEAPEST.

TRADE MARK.

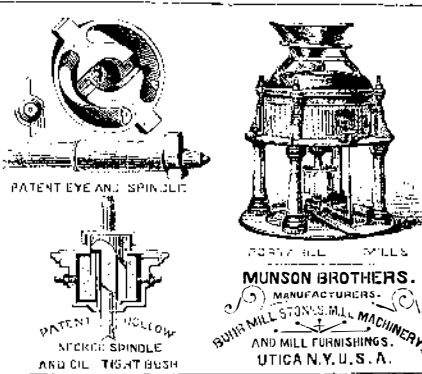
Silver Finish.

J. A. FAY & CO.,
(Cincinnati, Ohio, U. S. A.)
Exclusive Agents and Importers for the United States, of the
PERIN BAND SAW BLADES,
Warranted superior to all others in quality, finish, uniformity of temper, and general durability. One Perin Saw cuts three ordinary saws.

GRAY'S GRINDSTONE DRESSER.

KEPT IN STOCK BY

Hill, Clarke & Co., - - - Boston.
Hill, Clarke & Co., - - - St. Louis.
Manning, Maxwell & Moore, - - - New York.
John A. Roche, - - - Chicago.
C. Baird Machinery Co., - - - Pittsburg.
Niles Tool Works, - - - Philadelphia.
G. A. Gray, Jr. & Co., - - - Cincinnati.



WESTON DYNAMO-ELECTRIC MACHINE

The undersigned, sole agents for the above machine for

ELECTROPLATING AND ELECTROTYPING,

refer to all the principal Stove Manufacturers, Nickel and Silver Platers in the country. Over 1,500 now in use. Are also manufacturers of Pure Nickel Anodes, Nickel Salts, Polishing Compositions of all kinds, and every variety of supplies for Nickel, Silver, and Gold Plating; also, Bronze and Brass Solutions. Complete outfits for plating. Estimates and catalogues furnished upon application.

HANSON VANWINKLE & Co.
SOLE AGENTS NEWARK, N. J.

New York Office, 92 and 94 Liberty St.

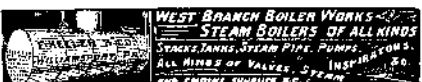
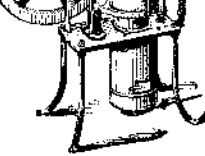
DEAFENING
FIRE AND VERMIN
PROOF

Sample and Circular Free by mail.

U. S. MINERAL WOOL CO., 22 Courtland St., N. Y.

WATCHMAKERS.

Before buying, see the Whitcomb Lathe and the Webster Foot Wheel, made by the AMERICAN WATCH TOOL CO., Waltham, Mass.

ERICSSON'S
New Caloric
Pumping Engine,

FOR
Dwellings & Country Seats
Simplest! Cheapest! Economical! Absolutely Safe!
Delamater Iron Works,
C. H. Delamater & Co.,
Proprietors,
16 Courtland Street,
New York, U. S. A.

WANTED—A First-class Mechanical Engineer and Draftsman who has experience in the construction of Automatic Engines. Address, with references, P. O. Box 175, Richmond, Va.

PATENTS.

MESSRS. MUNN & CO., in connection with the publication of the SCIENTIFIC AMERICAN, continue to examine Improvements, and to act as Solicitors of Patents for Inventors.

In this line of business they have had thirty-eight years' experience, and now have unequalled facilities for the preparation of Patent Drawings, Specifications, and the prosecution of Applications for Patents in the United States, Canada, and Foreign Countries. Messrs. Munn & Co. also attend to the preparation of Caveats, Copyrights for Books, Labels, Reissues, Assignments, and Reports on Infringements of Patents. All business entrusted to them is done with special care and promptness, on very reasonable terms.

A pamphlet sent free of charge, on application, containing full information about Patents and how to procure them; directions concerning Labels, Copyrights, Designs, Patents, Appeals, Reissues, Infringements, Assignments, Rejected Cases, Hints on the Sale of Patents, etc.

We also send, free of charge, a Synopsis of Foreign Patent Laws, showing the cost and method of securing patents in all the principal countries of the world.

MUNN & Co., Solicitors of Patents,
261 Broadway, New York.

BRANCH OFFICE—Corner of F and 7th Streets, Washington, D. C.