441,742

after it is dry, give it a light coat of shellac dissolved in alcohol. Lay the oil on as thin as possible or it will not dry. Or dissolve 1 ounce beeswax (genuine) in 1 pint boiled linseed oil, using a low heat. Rub it well in, and in general follow directions as above.

(2643) F. L. asks: 1. Will a clock (with a pendulum) and a watch which both show the same time at the equator show the same hour and minute if carried to any point between the equartor and pole? A. The pendulum beat will gain on the watch as it is carried toward the poles. A pendulum beating seconds at the equator should be 12-100 of an inch longer to beat seconds at the latitude of London, England. 2. Does cutting off the forests increase the amount of water or volume of a river? If so, would the amount of increase be lasting? A. Cutting of the forests may not materially lessen the yearly rainfall. The forests retain the water, lessen the flood wash, and thus equalize the climatic effect of atmospheric moisture. 3. What is sides made of plate glass well bedded in same. Asthe length of the day at the tropic of Cancer? A. The length of the day at the tropic of Cancer is 12 hours when the sun on the equator, at all other times it varies with the sun's declination. For the solution of the problem see Norton's "Astronomy." 4. What is the difference between heat and sheet lightning? A. Heat lightning is the distant flash that is not directly seen. Sheet lightning is seen in its broad flight from cloud to cloud, generally in complex thunder storms.

(2644) F. McL. asks: 1. Which is the better way to color a meerschaum pipe, with or without a false bowl? Isn't there a preparation that they can be boiled out in to help the coloring? A. Smoking is the best thing. There is a quick process, but it is kept a secret. They are sometimes boiled in wax. You might refer to queries 2364 and 2474. 2. What is the best way to select a meerschaum? A. Buy from a maker of reputation. No general rule of value can be given. 3. Is there any way to rid a building of cockroaches? A. Buhach or erythreum is highly recommended. It must be fresh. Also powdered borax and Persian powder have been found efficacious.

(2645) H. H. B. asks: 1. How to harden brass wire after hard soldering? A. Burnishing it will do this to a certain extent. 2. The unit of measure used in the sizes of watches, like size 18, 16, 6, etc.? A. The size is an arbitrary standard; in Europe the line (1-12 inch) is used; 16 size corresponds to 18 lines. 3. The unit of measure of watch glasses? A. The line (1-12 inch) is the unit. 4. Is there any thin substance which, brought between a permanent magnet and the bar which connects the poles, to cut off the magnet's influence from said bar? A. No; except a piece of polarizable metal such as iron, but none in the sense of your question. We do not understand your fifth query.

(2646) Photog. asks: Can you inform me through your paper how to prevent show windows (in stores) from frosting during cold weather? A. Ventilate from top of window casing by several three or four inch openings, with hoods to exclude rain.

(2647) Plumber asks: Will you be kind enough to send me a sample copy of the "Plumber's Problems"? A. We can supply you with the book called "Plumbing Problems," price \$2.

(2648) S. M. H.-It would be impossible from the specimen sent, without further data, to identify the plant whence the sample was derived. The substance is not a fiber, in the true sense of the term, but is of the nature of straw. It might be used in the manufacture of paper, but it has no fibrous quality that would cause it to hold together when twisted into twine. In addition, it is wanting in strength.

(2649) W. F. B. asks if any other color of hektograph ink may be made besides the violet, which is the only one he can find in the market. If it can be made in black, red, green, blue, or any other colors, please state what ingredients to use and how to make it? A. For hektograph inks use any colored aniline dissolved in a very little alcohol and diluted with water,

(2650) A.P. McR. wants a receipt for flint lime glass. A, The following are given as formulæ for

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Silica	100 66 26 7	100 70 40 3	100 80 to 85 35 to 40 2 to 3

ing the first steps are more difficult, and many positions, such as on railroad work, are only temporary. The different branches cannot well be enumerated. They include draughting room work, supervision of machine shops, surveying, bridge building, etc.

(2652) V. G. Van S. asks how mercurial thermometers are made to ring an alarm for heat and cold. To tell when the heat has reached a certain point and when it sinks a few degrees below. As glass is really a non-conductor I do not see how a contact point is made with the mercury inclosed in a tight tube of glass, especially when you want the alarm at different degrees of heat. A. Platinum wires are soldered into the glass, penetrating the walls of the tube and coming into contact with the mercury as it rises or falls. On this principle electric connections may be made or

(2653) H. W. S. asks: What is the reason for writing aluminium instead of aluminum? A. It is a matter of taste. Either spelling can be used. The names of the newly discovered metals generally terminate in ium, yet many of the Latin names for metals terminate in um, as plumbum, ferrum, argentum, etc. Aluminum is more etyn.ological, aluminium more in accord with modern nomenclature,

(2654) J. C. F. asks for the receipt for making a hektograph. A. You will find full directions and illustration of above in our Supplement, No. 438.

Replies to Enquiries.

The following replies relate to enquiries recently published in Scientific American, and to the numbers therein given :

Aquarium.—I would suggest to inquirer No. 2537 that he would be much more likely to have a permanently successful aquarium if he made the frame of three-quarter inch angle iron riveted with copper rivets. Twenty feet will be the length required and will cost about thirty cents. First make the entire frame, uniting the pieces together at corners, and then screw it down to the wooden base. The bottom should he lined with glass, slate, or a layer of cement and the pinwall Bath Enamel is excellent for painting all parts exposed to water. See Dr. Bateman's delightful book, "Fresh Water Aquaria," published by Gill & Co., London, 1890 .- WILLIAM H. PATTERSON.

NEW BOOKS AND PUBLICATIONS.

RUSSIAN COUNTRY HOME. By Carl Detlef. Translated from the German by Mrs. J. W. Davis. Photogravure illustrations by Walter H. Goater. New York: Worthington Co. Pp. 211

LEGAL HYGIENE, OR HOW TO AVOID LITIGATION. By A. J. Hirschl, of the Iowa Bar. Davenport, Ia. 1890. Pp. 203, iii.

This work is devoted to the tricks and subterfuges that may be practiced on the unsuspecting and to the means for meeting legal difficulties. It is spiritedly written and makes an interesting treatise of a very practical tone.

STATISTICS OF RAILWAYS IN THE UNITED STATES TO THE INTERSTATE COMMERCE COMMISSION FOR THE YEAR ENDING JUNE 30, 1889. Washington, Government Printing Office. 1890. Pp. 566.

But one commentary can describe this work, which is the statement that within its limits it is quite exhaus. tive. It gives the mileage, earnings, incomes, and other data of the United States railroads in such clearly classified form as to be invaluable to those interested.

SOUND, LIGHT, AND HEAT. By J. Spencer, B.Sc. London: Percival & Co. 1890. Pp. viii, 223.

The author of this work is headmaster of the science department, Bradford (England) college. The work is neatly printed, well illustrated, and is prepared as a class book for the elementary stage of the science and art department. Although calculated for this special horizon, its usefulness is not diminished thereby, and it is a good introduction to these three branches of

TO INVENTORS.

An experience of forty years, and the preparation of more than one hundred thousand applications for patents at home and abroad, enable us to understand the laws and practice on both continents, and to possess unequaled facilities for procuring patents everywhere. synopsis of the patent laws of the United States and all foreign countries may be had on application, and persons contemplating the securing of patents, either at home or abroad, are invited to write to this office for prices. which are low, in accordance with the times and our extensive facilities for conducting the business. Address MUNN & CO., office Scientific American, 361 Broad-

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

December 2, 1890,

AND EACH BEARING THAT DATE. [See note at end of list about copies of these patents.]

 Basins, waste pipe connection for, E. S. McClellan.
 441,681

 Bat, cricket, W. & J. B. Heighington
 442,046

 Bath. See Vapor bath.
 Battery. See Galvanic battery. Secondary battery.

 Bearing boxes, automatic adjuster for, H. L.
 Hopkins
 441,797

 Bed bottom, D. M. Bone
 442,008

 Bed bottom, O. S. Foster
 41,652

 Hopkins 441,797

Bed bottom, D. M. Bone. 442,098

Bed bottom, O. S. Foster. 441,652

Bed bottoms, attachment for spring, O. S. Foster. 441,653

Bed spring, E. W. Locke. 442,093

Bet tightener, W. King. 442,093

Bicycle, J. B. Dunlop. 441,649

Bicycle, J. B. Dunlop. 441,649

Bicycle lock, G. R. Fuller. 441,949

Bicycle lock, Q. A. Smith. 441,857

Bicycle lock, Q. A. Smith. 441,857

Bicycles, package holder for, F. Lynam. 441,657

Boliers, apparatus, F. E. Drown. 441,946

Boolers, apparatus, F. E. Drown. 442,043

Bottle, dose measuring, H. S. Herrick. 442,034

Bottle, dose measuring, H. S

Buildings, facing for walls of, G. Konigsberg 441,766	Heel burnishing tool, J. H. Busell
Burial apparatus, G. H. Clark Burial apparatus, G. H. Clark Burner. See Lamp burner. Vapor burner. Buttonhole cutter, E. O. Bartholo mew	High water alarm, I. H. Simpson
Buttonhole cutter, E. O. Bartholo mew	Holsting apparatus, J. Boyd
Calendar, C. A. Dickinson 442,023	er. Opera glass holder. Paper holder. Tool
Calendar, C. A, Dickinson 442,923 Caliper adjustment, A. Munch 441,685 Cam cleat, A. E. McClure 441,682 Camera See Panoramic camera	holder. Hook. See Electric line hook.
Camera. See Panoramic camera. Cane stripping machine, W. M. Carr	Hoop. See Barrel hoop. Hoop coupling, L. R. Fulda
Came stripping machine, W. M., Carr. 442.015 Cane, etc., walking, E. Hofel 442.085 Car brake, W. R. Zeigler 442.085 Car coupling, C. Schryver 441.07 Car coupling, Tatum & Cole 441.07 Car door, Warmer & Seath 441.07	Horseshoe fastening, E. T. Covell
Car coupling, C. Schryver. 441,707	Hose, manufacturing seamless tube rubber, E. N.
Car coupling, J. S. Ventress. 441,592	Hose, pliers for attaching couplings to, C. W.
Car door. Wagner & Seath 441,724 Car mounting railway, H. Resley 441,876 Car seat, G. W. Cushing 441,876 Car stake, railway, J. C. Barber 441,736 Car, street, H. H. Cummings 441,673 44,677 441,673	Kimball
Car seat, G. W. Cushing	Hydrant. Kupferle & Herman. Hydrocarbons for impregnating purposes, work- ing high boiling, Greenfield & Nagel
Car, street, H. H. Cummings	ing high boiling, Greenfield & Nagel 4
Cars, rod for coupling, J. B. Lewis. 442,031 Carriage, child's, P. Gendron 441,803 Carriage top, J. D. Whitney. 441,813 Carrier. See Cash carrier.	street indicator.
Carriage top, J. D. Whitney 441,813	Ink well holder, W. M. Brown
Cartridge for breech-loading cannon, S. Seabury 421,504	Insulator for heating pipes, G. W. Conderman4 Ironing table. J. D. Pace
Cash carrier, F. S. Church	liars, seal stopper for milk preserving, F. K.
Case. See Spectacle case. Cash carrier, F. S. Church	Ward
Chain, drive, J. Appleby	rail joint. Kiln. See Malt kiln.
Chair backs, machine for moulding, L. A. Chi-	Knitting machine take-un mechanism T H.
Cheese cutter, O. W. Smith	Worrall. Knobs, attaching, H. A. Matthews. Ladder, extension, J. B. Harvey.
Chopper. See Vegetable chopper. Clay burning kilns, utilizing waste heat of, J. S.	Ladder, extension, J. B. Harvey
Baldwin	Lamp burner, W. B. Somers
Clip. See Detector bar clip. Clock alarm, electric, M. W. Tiedemann 441,908	Lamp fixture, incondescent, F. Lewis Lamp shade support, G. W. Baldwin. Lamps, wick lift for, H. L. Clark. Lathee, shaper attachment for, Gook & Sherman. Leather rolling machine, J. A. Brownell.
Clock alarm, electric, M. W. Tiedemann	Lamps. wick lift for, H. L. Clark
Clocks, winding arbor for, F. L. Shaw	Leather rolling machine, J. A. Brownell
Clothes line, endless, W. W. Hatfield	
Clutch, M. F. Williams	Level, plumb k. Miller Lifter. See Cuspidor lifter. Transom lifter. Lightning arrester, J. J. Wood. Linear measure, electrical indicating apparatus for, J. Rapieff
Clutch, friction, J. Walker 441.726 Cockle separator, F. W. Howell 442.051	Lightning arrester, J. J. Wood
Cocks, apparatus for controlling and registering liquids drawn through, R. Jewell	for, J. Rapieff
Collar for training animals, A. Schneider 441,706	O. R. Nelson 4
Comminuting materials of a viscous or pasty na- ture, process of and apparatus for, G. W.	Liquids, apparatus for regulating the flow of, F. J. Mitchell
Goetz	Location and range finding instrument, electrical, J. Rapieff
Condenser plate, corrugated, E. Theisen 441.781	J. Rapieff Lock. See Bicyclelock. Nutlock. Seal lock. Lock. E. F. Barrows. Lock, C. E. Jones.
Confectionery, machine for working, O. R. Chase. 441.640 Cordage, machine for making, W. H. Avis	Lock, C. E. Jones.
Cork pulling appliance, A. J. Parker. 441,804 Corn cutter, J. H. & C. Burkholder 441,744 Corn, machine for breaking shelled, A. Ball. 442,006	Locks method of and means for sealing C R
	Hopkins
Cotton, etc., opener and picker for, G. Horrocks. 441.760 Coupling. See Car coupling, Electric wire coupling. Hoop coupling.	mechanism for electric, F. Mansfield
	Loom, needle, J. Graner. Loom temple, R. C. Irish. Mail bag catcher and deliverer. H. & C. Soggs
	Mail matter, machine for marking, F. N. Eth-
J. H. Mitchell. 441,890 Crane, traveling, J. Murrey. 441,686 Crushing roll, H. C. Behr. 442,006	Malt kiln, A. Rack
Cup. See Oil cup. Curbing and gutter, I. L. Landis	Map or curtain hanging device, R. J. Watts
Curtain fixture, C. Gunsel 441,955 Cuspidor lifter, G. S. Trumbore 441.721	Measure, tailor's, R. R. Lewis
Cut-off, C. W. Blake	Measuring vessel, Kiernan & Moore
Cut-off, C. W. Blake. 441,739 Cut-out, thermal, D. J. Cartwright. 441,938 Cutter. See Buttonhole cutter. Cheese cutter.	Measures, register for grain J. H. Lowery Measures, register for grain J. H. Lowery Measuring vessel, Kiernan & Moore. Meat cutter, M. Hofbauer. Mechanical movement, J. P. H. Gastrell (r) Mechanical power, J. H. Frey. Metallic crose tis M. F. Borgano.
Corn cutter. Meat cutter.	Mechanical power, J. H. Frey 4 Metallic cross tie, M. F. Bonzano 4
Cutting apparatus, E. J. Pullen	Metallic cross tie, M. F. Bonzano. 4 Meter. See Fluid meter. Piston meter. Mills. safety device for, G. Rieseck. 4 Moulding machine, W. F. Jones. 4 Moulding machine, W. F. Jones. 4
Mewborn442.070	Moulding machine, W. F. Jones
Detector bar clip, H. Johnson 441,798 Die. See Thimble die.	Motor. See Electric motor.
Digger. See Potato digger. Directory, night, H. Bergstein	Motor, J. A. Peer
Disinfecting apparatus, F. J. Mitchell	Mower, H. E. Pridmore
Directory, night, H. Bergstein 441,863 Distinfecting apparatus, F. J. Mitchell. 442,073 Door check, G. H. Markillie. 442,083 Door check, W. Windus. 441,914	Music leaf turner, L. I. Bridge
Door hanger, J. C. Wands 41,910	Mustache guard for drinking vessels, L. S. ware 4 Nippers, G. W. Hubbard 4 Nut lock, W. T. Cozart 4
Door closer, C. A. Root.	Nut lock, W. T. Cozart
Drill. See Grain drill. Drilling machine. S. & W. Garbrant	Nut lock, J. M. Telfer Oil cup, W. H. Wilkinson Oil, preparing acidulated, H. Noerdlinger. Opera glass holder, L. Winterdorf Ore contairing lead, silver, and zinc, treating, C.
Drilling machine, S. & W. Garbrant. 441.756 Drilling machine, J. Ross. 441.900 Dva red C. Drovfus 441.916	Opera glass holder, L. Winterdorf 4
Dye, red, C. Dreyfus	L. COMIL
	Ore distributer and sampler, J. D. Coplen
Electric conductors, conduit for, E. T. Greenfield 441,837 Electric light globes, guard for incandescent, J.	Ores, etc., crushing or pulverizing, T. R. Jordan. 4
Mino	Packing, metallic piston. E. C. Fasoldt
Electric ine hook, Locke & Lapp. 441,849 Electric machine, dynamo. W. K. Freeman. 441,793 Electric machine regulator, dynamo, W. K. Free-	Pantaloons, J. Bloch
man 441.794	Paper box machines, printing and sanding mechanism for, G. M. Griswold. Paper elbow or bend, tubular, E. T. Greenfield. Paper folding machine, J. L. Cox. Paper holder and cutter, roll, M. N. Jones.
Electric motor, H. Groswith 441,953 Electric motor regulator, W. E. Hyer 441,953 Electric motors, operating, H. Groswith 441,954 Electric motors or dynamos, brush holder for, W.	Paper elbow or bend, tubular, E, T. Greenfield 4
Electric motors or dynamos, brush holder for, W.	Paper holder and cutter, roll, M. N. Jones 4
S. Patterson. 441,635 Electric switch, F. E. Fisher 442,030 Electric wire coupling, W. E. Banta 441,988 Electric wires, underground conduit for, E. T.	Manahan
Electric wire coupling, W. E. Banta	Paper tube, D. N. Hurlbut
Greenfield	Photographic film. G. Eastman
W. Dewey 441898	Brav 4
Electrode, secondary battery, Bradbury & Stone. 441,818 Electrode, secondary battery, C. W. Kennedy. 441,859 Electroplating, apparatus for, W. J. Possons, 199	Piston meter, A. Bonna
441,893, 441,893	Planter, check row corn, J. Flynn 4
Electropiating carbons or other articles, appara- tus for. W. J. Possons	Planter, corn, G. Fry
tus for, W. J. Possons. 441.894 Electrotype, W. T. Barnum. 441.920 Elevator, R. Butterworth. 441.824 Elevator, C. E. Torrance. 441.738	bounds in liquid form, apparatus for diffusing
Elevator, C. E. Torrance	upon, S. H. Stott
Embossing machine, S. Ross. Jr	Polisher, Bennett & Boardman 4
Embossing machine, S. Ross. Jr	Polishing machine, J. B. Bennett
Steam engine, Engine E Field 442.027	Polishing machines, vibrator attachment for, Bennett & Boardman4
Ecophone, F. Della Torre	Porous bodies, impregnating, Greenfield & Nagel. 4
Explorer's instrument, J. L. Sim mons	Potatodigger, P. J. Tunny 4 Pottery machine, J. G. Whilldin 4 Powder box, G. Mennen 4
extractor.	Powder box, G. Mennen
Eyeglasses, nose guard for, W. Dengler	Printed sheets for drying, preparing, E. N. Blue 4
Harm gate W S 197 441.752	Printing attachment for paper roll holders, Har- rison & Westervelt
Faucet extractor, R. D. Black. 441.864 Feed water regulating device, C. B. Bosworth. 441.741 Feed water to boilers, device for supplying, C. B.	Printing machine, ticket, R. A. Stewart 4
Bosworth 441,740 Fence, J. H. Hammer. 442,019	Printing machines, delivery mechanism for web, S. D. Tucker. Printing press inking device, J. L. Cox441,789, 4
Fence, H. A. Holibaugh	Drajactiles hardening or tempering steel D Low A
Fence, H. A. Holloaugh. Fertilizer distributer, W. A. Davis. 441,791 Fire escape, C. Bresuahan 441,819 Fire extinguisher, A. L. Pitney. 441,869 Fire extinguisher, automatic, J. Bishop. 441,929 Fire extinguishing apparatus, J. E. Prunty. 441,867 Flue cleaner, Douler, G. S. Smith. 441,868 Fluid meter, C. N. Dutton. 442,864	Propulsion of vessels, S. A. Owen
Fire extinguisher, A. L. Pitney	Pump strainer, C. G. Jaycox 4
Fire extinguishing apparatus. J. E. Prunty 441,697 Flue cleaner, boiler, G. S. Smith	Puzzle, G. L. Stairs
Fluid meter, C. N. Dutton 442,024 Foot cleaner, A. C. Birge 41,521 Frame. See Satchel frame.	Railway gate, J. M. Grisham 4 Railway gate, W. Zeller 4 Bailway join t. H. D. Avera 4 Railway joint, Morgan & Daffron 4
Frame. See Satchel frame.	Railway joi t, H. D. Avera
Fruit drying tray, Hammon & Sechrist	Railway rail joint, R. I. Verpianck
Fuel feeder, pulverized. J. G. McAuley 441.688	Railway signai, automatice estric, R. O. Owell 4 Railway tie, metallic, V. A. Tyler
Fuel feeding apparatus, J. G. McAuley	Railways, moving contact for electric, A. W.
Furnace fuel feeding apparatus, W. S. Walker 441.725	Adams
Gauge. See Surface gauge. Water gauge. 441,843 Galvanic battery, A. H. Hoy. 441,843 441,987 Gas engine, rotary, G. H. Chappell 441,987	Range finders, indicator for, J. Rapieff 4
Gas engine, rotary, G. H. Chappell	Range of distant objects, finding, J. Rapieff 4 Reefing gear for sailing vessels, T. O. Mahoney 4
Gas bides and humps, abbaratus for testing, mar-	Refrigerating apparatus, w. E. racer 4 Refrigerating apparatus, gas compressor for. N.
rison & Sheard 441.659 Gas producer, J. W. Culmer 441.941 Gate. See Farm gate. Railway;gate. Glazier's diamond, J. E. Lloyd 442.062	W. Wheeler 4 Refrigeration, machine for artificial, N. W.
Glove band, C. E. McElroy 441,693	Wheeler 4 Regulator, See Electric machine regulator, Elec-
Governor engine, R. M. Reck 441738	l tric motor regulator. Heat regulator. Motor
Governor, Reamengine, L. Anderson	regulator. Temperature regulator. Rolling metal, machine for, Sargent & Stevens 4 Rolling mill feed table. T. J. Price 4
Grinding machine, G. E. Whitehead 441,997	Rolling mill feed table. T. J. Price
Gun, Tl. Lovegrove	Rowing machine, S. H. Kimball
Guard: See Mustache guard. Gun, T. J. Loverrove. Gun, air, S. D. Engle. Gun, magazine, K. Kruka. 42,053 Gun, magazine, K. Kruka. 42,053 Hall at Rufflat-put Berger.	Sash balance, R. M. Gardner
Gun, straight-pull breech-loading, S. & K. Krnka. 441,673 Halter, Wilson & Harvey	Satchel frame, L. Hummel. 4 Saw, band, C. W. & A. S. Gage. 4 Sawnill dog, Denison & Parnell. 4
Halter, Wilson & Harvey	Sawmill dog, Denison & Parnell. 4 Sawmill dog. N. C. Buch. 44 Saw set, C. Morrill. 441,962, 4
Troney wire nanger.	Saw set, C. Morrill Saw teeth, device for side dressing, J. B. Rhodes. 4 Scaffold bracket, extension, T. Vassall
Horrow and cutter combined T. Flanagan 442 081	Scale, platform, J. P. Cowan
Harrow, disk, H. S. Howard 442,050 Harrow, rotary, H. H. Monroe 441.851	Scale, platform, J. P. Cowan Scale, vernier, S. Darling Scales, automatic grain, T. F. Gray Scales, coin-controlled weighing, W. R. Smith. 4 Scales, P. J. Church
Harrow, disk, H. S. Howard 442,050 Harrow, rotary, H. H. Mooroe 441,851 Harrow, spring tooth, D. C. Markham 442,067 Harvester, corn, C. H. Salgman 41,809	Scales, coin-controlled weighing, W. R. Smith 4 Seal lock, E. L. Church
Harvester, cotton, G. N. Todd. 441,717 Harvester, grain, H. C. Stone 441,717	Seal lock, D. F. MacCarthy
Hats, receptacle or holder in, A. J. Parker 441,805 Heat preserving apparatus A. A. Frey 441,805	Seal lock, D. F. MacCarthy Seams, stopping, M. Garvey Seams, stopping, M. Garvey Secondary battery, Kennedy & Groswith Secondary battery, Kennedy & Groswith Seed and fertilizer distributer, G. F. Strawson.
Harvester, cotton, G. N. Todd. 441,717 Harvester, grain, H. C. Stone. 441,717 Harvester, grain, H. C. Stone. 441,717 Hats, receptacle or holder in, A. J. Parker. 441,805 Heat preserving apparatus, A. A. Frey. 441,835 Heat regulator, N. Curtis. 441,635 Hedge trimmer, A. M. Fox. 442,835	Seed and fertilizer distributer, G. F. Strawson,
Hedge trimmer, A. M. Fox 442,035	Separator. See Cockle separator.