Bleaching Cotton Piece Goods.

Cotton piece goods are bleached in different ways, according to the use to which they are to be put. The operation is generally performed in such a way that the singed and washed piece is first passed through a lime bath of 5 lb. of lime to 100 lb. of goods. The material is next washed, acidulated with hydrochloric acid, ¾ to 1½° B., then boiled—4 lb. soda, 2 lb. resin, and 1 lb. caustic soda being used per 100 lb. of goods; washed again, and treated in a chloride of lime bath of 1½ to 2 lb. chloride of lime per 100 lb. of material; acidulated with hydrochloric acid, 1½° B.; again washed, and then dried. Attempts have often been made to combine the processes of chloring and acidulating, but without satisfactory results, the pieces so bleached having a yellow tinge after washing. In many bleaching establishments the liming process and the boiling are united, the cotton pieces being boiled in a lime and soda solution.

In large cloth printing houses the cotton pieces are singed first, then washed, limed, acidulated, washed again, and afterward boiled out twice with soda, caustic soda, and resin. The quantity of ingredients to be used for the boiling operation depends on whether the cloth is to be treated in the open or closed vat, under pressure, and, if the latter, the quantity of caustic soda is decreased. After boiling from 6 to 12 hours, the pieces are washed in the washing machine, then entered into the chloride of lime bath, next taken out and entered direct into the acid bath, in which they remain for a short time, after which they are washed again and dried. All these operations are performed by the continuous process—that is to say, the pieces are stitched together at the ends and are passed in rope form through the different baths in succession. To remove any remaining chlorine, the washed pieces are passed through a cold solution of bisulphite of soda, and again washed. In the continuous process, care must be taken to pass the washed cloth through a vessel containing diluted spirits of hartshorn, in order to remove every trace of free acid. To bleach 100 lb. cotton cloth, a lye consisting of 10 lb. lime and 10 lb. calcined soda is prepared, allowed to settle, and the clear fluid is poured into the boiling-out vat. The cloth is then entered into the suitably diluted lye, and boiled from 6 to 8 hours, after which the liquor is allowed to run off, and the cloth is cooled with cold water. Next, the goods are thoroughly acidulated with hydrochloric acid, ½ to 1° B., and washed in the washing machine. For 100 lb. cloth, the chlorine liquid is prepared from 1¼ to 2 lb. chloride of lime, rubbed in water, in a perforated drum, into a fine milk, then strained, and the cleared liquid is used for bleaching. The chloride of lime bath is started with cold water, the prepared cloth being immersed in it from 6 to 8 hours, after which it is taken out and acidulated in a cold bath with hydrochloric acid of 1° B.; then washed and dried.

The addition of a little petroleum naphtha to the boiling-out bath has been recommended, in order to increase the cleansing effect, which process has proved quite efficient; in this case, however, the boiling water must not contain lime, but only caustic soda, resin, and soda. If this mode of cleansing is adopted, the cotton cloth is first treated in the lime bath, then acidulated and washed, and afterward entered into the boiling-out bath.

It is necessary in bleaching cotton cloth to distinguish between the so-called market bleach and the printing bleach. The first does not require the addition of resin soap, although when it is used the white obtained is always clearer and brighter, but the second bleach does. It is well known that print cloth bleached without resin soap or not sufficiently boiled out prints badly and that a clear white on it is impossible, but the co-operation of the dissolving resin is indispensable for the print bleach, because, besides the natural impurities of the cotton that remain in the cloth, there are those resulting from the weaving, etc., which are removed by the resin soap.

Experiments for bleaching cotton cloth with peroxide of hydrogen have been quite successful, but it has been found that this method is too expensive. It has, therefore, not been generally employed, except for very fine cotton cloths, the price of which can include a suitable charge for bleaching.

The electrolytical bleaching methods have lately been regarded more favorably; the Hermite mode, the oldest, has had to stand many attacks, and it is still doubted whether it can be used on a large scale. The more recent methods by electrolysis are all based upon decomposing a solution by electrolysis and bleaching the cloth with it, but it is not yet known what would be the result in actual practice, as such a plant requires the outlay of much capital. The latest bleach method—Siemens—i. e., by the use of ozone, is still too much a matter of experiment only to be able to express an opinion here, the views regarding its practicability differing most widely. It is stated, however, that by the use of the Siemens apparatus, it is possible to generate 20 grammes ozone per horse power per hour. This is a very small quantity, but when one considers what an immense effect can be produced by it, one is almost forced to conclude that, in the near future, the bleaching of cotton cloth with ozone will be attempted in the cotton goods industry.—Farber Zeitung.

The Maximum Depth of the Ocean.

A sounding has recently been taken in the Pacific Ocean, near the coast of Japan, which showed a depth of 29,400 feet, or approximately 5½ miles. This is a little more than the height of the loftiest mountain, Mount Everest, which is situated in the Himalaya range, to the north of India.

How much deeper the Pacific is than this it is impossible to tell; the wire having broken, presumably through its inability to sustain its own weight. In a previous attempt to reach the floor of the ocean at this spot, the wire broke at a depth of 25,800 feet. It has been suggested, as one theory of the formation of mountain ranges, that they represent the crumpling up, or buckling, of the earth's crust under the severe contraction strains that were set up as the surface of the globe solidified.

If this be true, the deep ocean valleys or gorges, such as this off the coast of Japan, must be the result of the same action. Taken in connection with the loftiest mountain, this sounding gives a difference in distance from the earth's center of about twelve miles, or $\frac{1}{888}$ of the earth's radius.

The Thermophone.

This is an electrical apparatus in which sounds are produced by the changes in the circuit due to variations of temperature. Its use is to measure temperature, particularly the temperature in a distant or inaccessible place; at the bottom of a pond, for instance. For obtaining deep sea temperatures it is useful, and it may also prove of great service in the ventilation of buildings, for by this instrument the temperature of any room in a building can be registered on a dial placed in the hall. The scientific uses of the thermophone are obvious, and it will be of great aid to physicists in determining the fluctuations in the temperature of the soil and the difference in temperature between the water at the surface and that at the bottom of ponds or lakes.

RECENTLY PATENTED INVENTIONS.

Engineering.

FURNACE.—Milton T. J. Ochs, Allentown, Pa. This is a furnace especially designed to utilize as fuel tan bark, mill refuse, and similar material. A series of transverse arches is arranged in step-like order above the grate, their adjacent edges overlapping and spaced apart to form latetal openings for the products of combustion to pass between the arches, there being in the furnace walls flues whose lower ends open into the ashpit below the grate while their upper ends open into the fire box below the arches.

Railway Appliances.

CAR COUPLING.—Robert T. Dressler, Buchanan, Mich., and Velimir Timitch, Hastings, Neb. According to this improvement the coupler has its drawhead pivotally connected with the draw bar for a horizontal oscillatory movement, and the draw bar is pivotally connected to the car frame and held in engagement with adjusting and locking devices whereby the bar may be adjusted vertically. The coupling is automatically effected when the drawheads come together, the uncoupling being effected from the top or sides of the car, and the coupling members being positively held from jumping up when they engage.

FARE BOX.—Le Roy C. Godwin, Portsmouth, Va. This is a box adapted to be supported from the body of the conductor by a shoulder strap for the reception of fares, the coin after having been placed in the box being still visible. There is also a purse or storage chamber for the final reception of the coin, provided with a suitable locking device. The throat or inlet of the box is so made that a coin may be readily passed in, but cannot afterward be fished out.

Miscellaneous.

BICYCLE DRIVING GEAR.—Dan Gregory Bolton, Cooperstown, N. Y. This is a changeable gear, light, strong and simple, for driving a wheel with more power and slower speed up a hill or on rough road, or at a greater speed on a level. The change from one gearing to the other is readily made by means of a hand lever, without inconvenience to the rider, and the construction is designed to combine the maximum of strength with the minimum of weight.

BICYCLE BELL.—I. N. Hopkins, Lockport, N. Y. This improvement combines a bicycle handle and alarm bell, which can be readily placed on the handle bar instead of one of the ordinary handles, and be operated by the thumb of one hand. The handle is tubular, and at its outer end is a metallic ring integral with a yoke which snpports the bell, whose rim is near but not in contact with the end of the handle, the external form of the bell conforming to the curvature of the handle, and forming a properly rounding finish for the handle end.

WALL TELLURIAN.—Grant B. Nichols, Wapakoneta, Ohio. This is an apparatus adapted to be folded against a schoolroom wall, to take up but little space, and comprising an inclined table with apertures arranged in an ellipse to represent the path of the earth, a second series of apertures representing the path of the moon with respect to the earth, a rod in a central aperture carrying a ball representing the sun, while ball-carrying rods represent the earth and moon, these rods to be at any time inserted on the proper date in their respective apertures, to show the relative positions of the sun, earth, and moon. The invention also comprises other valuable features designed to facilitate the work of teachers.

INDEX CUTTER.—Frederick C. Mehnert, Goshen, Ind. For cutting the index sheets or leaves of books this inventor has devised an apparatus to be easily operated by an inexperienced person, doing the work with great precision and rapidity. The book whose leaves are to be cut is placed on an adjustable platform, when the leaves are laid on a die and beneath a presser foot, and, by stepping on a treadle, a cutter head is moved down to cut the leaves. The platform may be automatically fed lengthwise to bring successive leaves in position to be cut.

COPYING BOOK.—Edwin Fowler, Kansas City, Mo. This is a letter press book having a series of sheets forming surfaces receptive of copying ink for press copying, the sheets bearing consecutive numbers or letters in copying ink, which numbers are transferred to letters copied. By this means copied letters may be conveniently designated and found in the copying book.

HYDROCARBON BURNER.—Jacob W. Rees, Cleveland, Ohio. This burner is adapted to burn either oil or gas, producing the gas from oil, and is provided with an asbestos-lined drip pan adapted to be set in the fire box of an ordinary cook stove, burners being supported on standards above the drip pan to bring the flame to the proper position. Oil burned on the drip pan generates gas in a generator supported above the pan when the apparatus is employed as a generator and burner.

TYPEWRITER ATTACHMENT.—William S. Bigelow, Boston, Mass. This invention provides a simple device by which the key when depressed will be held down, as when upper case or figure printing is to be done, the key being released by a natural and easy movement of the hand and finger, when such printing is finished, to throw the machine into normal position. An independent spring catch is adapted to engage and project above the key to hold it depressed, the key being released by a wiping or drawing movement of the operator's finger.

PHOTOGRAPHIC SHUTTER RELEASER.—Arthur M. Boos, Boston, Mass. To automatically release the shutter, in time or instantaneous work, enabling the photographer to be away from the camera while the exposure is made, this inventor has provided a device for pressing the shutter-releasing button, the device being normally held out of contact by a fuse string, the time of burning of which regulates the duration of the exposure.

MUSICAL INSTRUMENT.—Lewis E. Pyle, Elam, Pa. This invention relates to mandolins, guitars, etc., and provides an instrument designed to be rich in melodious tones, while it is arranged to prevent bending of the neck, and formed to fit properly on the body to facilitate executing the music. The body of the instrument is approximately heart-shaped, and the tailpiece is located in the recess at the base of the instrument, being thus protected from contact with any surface on which the instrument may be placed.

FISH POND.—Charles Braaf, New York City. This is primarily an apparatus to afford amusement, comprising a pond or aquarium inwhich artificial fish may be placed and kept constantly moving to represent life, the water being also in motion. The construction is such that a single attendant may wait on visitors, and a stand is also provided for the display of prizes, each fish being numbered and the prizes being for successful fishers.

BEDSTEAD.—Andrew Stratton, Augusta, Wis. This is an improvement in bedsteads which have legs that fold and provided with casters for easy movement. A supplemental frame is arranged to telescope on the bed frame, and prop legs pivoted on one frame have their ends arranged to engage the other frame, there being means to hold the prop legs in adjusted position. The bedstead, when not in use, may be made to take up but little floor space.

BATH TUB.—Elizabeth G. Smith, New York City. This invention provides a tub which may be readily moved from place to place and conveniently set up, the tub having a collapsible frame, the bottom and auxiliary sides of which are formed of a sheet of waterproof material, the sheet having stiffened edges adapted to pouring water therefrom, while removable fastening devices hold the sheet in engagement with the upper edges of the frame.

STOVE.—Mark W. Foster, Pecatonica, Ill. In heating stoves which have a horizontal damper or diaphragm dividing its interior into two compartments, this invention provides an improved construction, there being a slidable horizontal damper in the combustion chamber with a central opening directly beneath the pot hole, there being an independently slidable plate for closing the opening. Special means are also provided for suspending and rocking the grate.

VEHICLE RUNNING GEAR.—James Duncan, Adelaide, South Australia. This invention provides for the employment of a special spring bed extended so as to also form a draught bar, at the two ends of which are lugs or joints which are fitted to and receive the shaft ends or pole bracket ends, the joints being above the springs. The improved construction, which is applicable to buggies and other four-wheeled road vehicles, is designed to obviate a great deal of friction, wear and rattle.

VEHICLE CURTAIN.—Frank Lane, Newark, Ohio. For buggies, phaetons and similar top carriages, this invention provides a curtain arranged to be easily and quickly operated to open or close the sides of the vehicle, the improvement comprising a tubular casing or socket in which is journaled a spring-pressed roller carrying the curtain.

THILL COUPLING.—Frank W. Warner, Angelica, N. Y. This coupling has a clip plate with transverse slotted socket in which is held the shank of the thill iron, screw bolts across the ends of the socket bearing on the ends of the shank. The clip plate is formed of a single piece of sheet metal having one end wider than the other, the opposite sides of the wider end having opposite wings oppositely perforated.

TRUSS.—Joseph Fandrey, Santa Barbara, Cal. This is a device for the support and reduction of hernia, and designed to be specially adapted for the cure of abdominal ruptures, while being easy to wear and not liable to shift from its position.

Designs.

PUMP CASING.—Aquila B. Marshall, New York City. This design shows a casing especially designed for a bicycle air pump, and having a cylindrical portion and a broadened end.

BADGE.—Charles A. Barker, New York City, and Frederick L. Green, Long Island City, N. Y. This design simulates an elephant in profile and in front view, while a spur from the back forms a support.

CHRISTMAS TREE ORNAMENT.—Victor A. De Prosse, San Francisco, Cal. This design affords a decoration made to represent a conventional flower or lily.

NOTE.—Copies of any of the above patents will be furnished by Munn & Co., for 25 cents each. Please send name of the patentee, title of invention, and date of this paper.

NEW BOOKS AND PUBLICATIONS.

PHOTOGRAPHY: ITS MATERIAL AND APPLIANCES. With some remarks for the use of non-proficients on their choice and application. London: John Birch & Company, Limited. 1895. Quarto. Pp. 140. Profusely illustrated. Price $3.

This work is issued for circulation in foreign countries and especially in the British colonies, and is issued by the well known firm of merchants and engineers, who do a large commission and manufacturing business. The first part of this work is devoted to descriptions of photographic apparatus and directions and formulas for working various processes. The second part is devoted to a priced catalogue of photographic apparatus. It is rather extraordinary to make buyers pay for a trade catalogue; it is, however, an English custom. The reading matter in the front occupies only 128 pages and is hardly worth the price charged—seven shillings and sixpence.

AMERICAN STEAM AND HOT WATER HEATING PRACTICE. New York: The Engineering Record. 1895. Pp. 317. Large 8vo. Profusely illustrated. No index. Price $4.

This is a selected reprint of important articles which have appeared in the Engineering Record, a journal of

high standing. The present work, which is sure of a large sale, is intended to supplement "Steam Heating Problems," which was published in 1888. The new volume includes a description of some of the best expositions of heating and ventilating design as applied to modern structures of the most extensive kind, as well as a description of various problems arising in this department of building engineering. The book is profusely illustrated with large scale plans and details of some of the best known installations in the United States, and includes work done in the ordinary residence up to the largest and most expensive plant for heating public buildings and churches. The work can be especially commended for the excellence of these plans, which seem to leave nothing to be desired. It is to be regretted, however, that an index was not provided, for even the very full table of contents does not take the place of an index, with which all scientific and technical books should be provided.

PHYSIOLOGY. By A. Macalister, LL.D., M.D. London: Society for Promoting Christian Knowledge. 1895. Pp. 123. 18mo. 59 illustrations. Price 40 cents.

This book belongs to the "Manuals of Elementary Science" series. The author has endeavored to present in a simple and concise form some of the elementary principles of the physiology of man. As the space at disposal is small, the author has selected such portions of the subject as are calculated to be of use to the general reader who is desirous to possess an intelligent appreciation of the nature of the parts of the body and their several functions.

HOW TO STUDY STRANGERS BY TEMPERAMENT, FACE AND HEAD. By Nelson Sizer. New York: Fowler & Wells Company. 1895. Pp. 380. 8vo. 300 illustrations. Price $1.50 in cloth, paper 70 cents.

The author of this work has for more than half a century been engaged in the study of human character, and as the result of such long and varied experience has produced a book the object of which is to teach one how to read the character of the stranger or the friend. It is eminently practical in its teachings, simple and pointed in its language. The three leading features of the book are: I. The Analysis and Illustration of the Human Temperaments. II. Child Culture. III. Character Studies.

REPORT OF THE BOARD OF LIBRARY COMMISSIONERS OF NEW HAMPSHIRE. December 1, 1894. Concord, N. H. 1894. Pp. 77, 8vo.

Business and Personal.

The charge for Insertion under this head is One Dollar a line for each insertion: about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in the following week's issue.

Notes & Queries

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters, or no attention will be paid thereto. This is for our information and not for publication.

References to former articles or answers should give date of paper and page or number of question.

Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all either by letter or in this department, each must take his turn.

Buyers wishing to purchase any article not advertised in our columns will be furnished with addresses of houses manufacturing or carrying the same.

Special Written Information on matters of personal rather than general interest cannot be expected without remuneration.

Scientific American Supplements referred to may be had at the office. Price 10 cents each.

Books referred to promptly supplied on receipt of price.

Minerals sent for examination should be distinctly marked or labeled.

(6671) W. B. McP. asks: 1. Is there any foundation for the theory of getting better health by sleeping with the head to the north? If so, why? A. It is doubtful if any particular benefit is derived from sleeping with the head to the north. Yet it has been asserted by nervous people that a difference was noticeable in their temper and composure with changes of sleeping position in regard to the magnetic polarity of the earth. 2. Where can I get the glass tubes, retorts and other implements necessary for a few simple experiments in chemistry? Is there any firm that manufactures them that issues a catalogue? A. Address Eimer & Amend, Third Avenue and Eighteenth Street, New York, for catalogue of chemical furniture and supplies.

(6672) W. F. C. writes: When steam boilers are full of water, is it possible to raise the temperature and pressure to a dangerous degree? If not, the water jackets surrounding gas engine cylinders might be filled in a similar way and the necessity of maintaining a continuous circulation of cold water avoided. A. There is danger in heating a closed boiler full of water. The expansion of the water would rupture the boiler if there were no safety valve. It is a common practice to use an iron open tank filled with water and connected with the water jacket of a gas or gasoline engine in such way that a continuous circulation of water through the cylinder jacket takes place, the large surface of the iron tank being sufficient for keeping the water cool.

(6673) J. W. says: I want to know what is the best way to keep the windows in a store from sweating and spoiling the goods. A. To keep frost, etc., off plate glass windows, keep the inside air dry, or inner sash tight, so that the air in window inclosure will be cold, and ventilated from the outside. A partial remedy is to have ventilating openings in the top of the window casing. A thin coat of pure glycerine applied to both sides of the glass will prevent any moisture forming thereon, and will stay until it collects so much dust that it cannot be seen through. Surveyors can use it to advantage on their instruments in foggy weather. In fact, it can be used anywhere to prevent moisture from forming on anything, and locomotive engineers will find it particularly useful in preventing the accumulation of steam as well as frost on their windows during the cold weather.

(6674) N. B. W. ask: 1. What is the best proportion of air and gasoline vapor for a gasoline engine? A. 25 to 40 volumes, according to the composition of the gasoline. 2. At what temperature will it explode? A. At a full red heat, say 2000° Fah. 3. Describe Tesla's electric motor. A. See our SUPPLEMENT, Nos. 692, 944, 1025.

(6675) H. A. W. asks how to make French mustard. A. The following is M. Lenormand's recipe: Flour of mustard, 2 lb.; fresh parsley, chervil, celery and tarragon, of each ½ oz; garlic, 1 clove (or head); 12 salt anchovies (all well chopped); grind well together, add salt, 1 oz.; grape juice or sugar to sweeten, and sufficient water to form the mass into a thin paste by trituration in a mortar. When put into pots a red hot iron is momentarily thrust into the contents of each, and a little wine vinegar added.

(6676) H. J. T. asks how to make gelatine capsules. A. Dissolve in a water bath 10 parts of gelatine, 2½ parts of sugar, 1¼ parts of gum arabic in 10 parts of water. Take iron pins, the lower ends of which are pear-shaped and slightly oiled, dip in this solution when it is lukewarm. When the gelatine films are congealed, detach them, and place in holes of the same size in wooden forms, to dry. The capsules are filled with the desired medicine and closed with a drop of the same solution.

INDEX OF INVENTIONS

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December 3, 1895,

AND EACH BEARING THAT DATE.

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Engines, adjustable igniter for explosive, T. G. Cantrell ... 550,743
Evaporative condenser for fluids, E. Theisen ... 550,853
Evaporator, J. Van Ruymbeke ... 550,699
Exchange system, automatic, J. G. Smith ... 550,729
Exhibition stand, H. A. Buchholz ... 550,779
Eyeglasses or spectacles, A. E. Butterfield ... 550,864
Fabric. See Knit fabric. Lace fabric.
Fan, J. Grant ... 550,679
Fan and concentrator, centrifugal exhaust, W. R. Marshall ... 550,797
Fats, making edible, Cordeweener & De Kunwald ... 550,676
Feeder and mixer, combination, J. Fenimore ... 550,912
File, A. J. Wells ... 550,923
File holder, E. W. Farnham ... 550,607
Filter, Brinckman & Wiederholdt ... 550,583
Filter, H. Deck ... 550,597
Filter, J. Graves ... 550,680
Filter, C. C. Worthington ... 550,706
Filter press, F. A. McKeone ... 550,639
Filtering stopper for bottles, J. J. Van Hest ... 550,893
Firearm, magazine, J. M. Browning ... 550,775
Fire extinguisher, automatic, W. W. Burson ... 550,820
Fireproof construction, W. Orr ... 550,801
Fireproof floor, O. Hammerstein ... 550,612
Fishing reel, T. J. Halleck ... 550,883
Flanging presses, adjustable hydraulic cylinder for, E. A. W. Jefferies ... 550,916
Fluid supplying device, A. C. Getten ... 550,609
Flywheel brake, L. Jacob ... 550,792
Fork with removing plunger, A. Young ... 550,768
Furnace. See Electric furnace.
Furnace for heating slabs, Bagley & Roberts ... 550,774
Gage. See Bevel gage.
Galvanized sheets, apparatus for cleaning or washing and drying, S. T. Thomas ... 550,806
Game apparatus, W. G. Bristow ... 550,584
Game apparatus, M. J. Post ... 550,803
Garbage treating apparatus, C. A. Weeks ... 550,664
Gas engine, rotary, W. R. Campbell ... 550,742
Gas engine, J. W. Lambert ... 550,832
Gas or combustible vapor motor engine, Burt & McGhee ... 550,674
Gas or vapor engine, O. Colborne ... 550,675
Gate. See Irrigation head gate. Railway gate.
Gate, C. A. Huffmaster ... 550,720
Gear, friction, C. & H. Burgon ... 550,862
Generator. See Steam generator.
Glass beveling machine, R. A. Schlegel ... 550,695
Glasses, machine for grinding edges of optical, J. E. Germain ... 550,787
Glasses, machine for polishing optical, J. E. Germain ... 550,789
Glasses, machine for rough grinding optical, J. E. Germain ... 550,788
Glove, R. R. Chant ... 550,592
Grate, rocking, J. Halpin ... 550,754
Grave vault, M. G. Gray ... 550,610
Grinder, plane and chisel, J. Mowrer ... 550,635
Hame, T. C. Hackett ... 550,882
Hammer, power, W. H. Botting ... 550,581
Hanger. See Shafting hanger.
Harness, W. N. Carlisle ... 550,936
Harrow, L. J. Becker ... 550,859
Harrow, disk, R. K. Swift ... 550,661
Harrow, roller truck, J. Anderson ... 550,576
Hat and coat rack, H. Westphal ... 550,736
Hay rake, J. M. W. Long ... 550,722
Hay rake, sulky, D. M. Jennings ... 550,889
Heater. See Hot water heater. Steam or hot water heater.
Heating device, G. W. Howard ... 550,617
Hedge plashing appliance, M. Neil ... 550,640
Hog ringing device, Goling & Kieffer ... 550,879
Hooks and eyes, construction of, J. C. Newey ... 550,839
Hot water heater and cooking range, combined, Ekstrand & Waterman ... 550,677
Hunter's blind, Murphy & Beck ... 550,762
Hydrant, fire, W. W. Corey, Jr ... 550,595
Hydraulic jack, J. Weeks ... 550,702
Hydrocarbon motor, J. E. Friend ... 550,785
Indicator. See Seat indicator. Speed indicator.
Inkstand, F. Carlson ... 550,780
Infant's chair, V. E. Harvey ... 550,613
Insect trap, C. H. Lawton ... 550,891
Insulator, cross-over, F. G. Beron ... 550,673
Irrigation head gate, J. M. Eads ... 550,710, 550,711
Jack. See Hydraulic jack.
Kiln. See Brick drying kiln.
Kiln for burning clay wares, A. Yates ... 550,707
Knife. See Cutter head knife.
Knit fabric, tubular, H. E. Hinchliff ... 550,874, 550,875
Knitting machine, circular, W. L. & A. T. Cathcart ... 550,591
Knockdown box, E. M. Scott ... 550,648
Label machine, F. Talcott ... 550,731
Lace fabric, twist, E. Cope ... 550,745
Lamp, electric arc, T. E. Adams ... 550,574
Lamp, electric arc, Doubrava & Donat ... 550,600
Lathing, furring for metallic, G. M. Wright ... 550,939
Leather folding machine, C. A. Bonney ... 550,929
Liquid containing can, M. L. Schlueter ... 550,696
Lock. See Permutation lock. Seal lock.
Lock, C. M. Stone ... 550,655
Loom shuttle binder, J. Cowgill ... 550,596
Loom shuttle tension device, S. M. Hamblin ... 550,611
Low pressure alarm, G. Heffner ... 550,884
Lubricator. See Axle lubricator.
Lubricator, H. P. Holt ... 550,887
Lumber trimmer, T. A. Coleman ... 550,594
Mash machine, J. Brauer ... 550,817
Measuring and winding ribbon, apparatus for, S. Blumenthal ... 550,741
Measuring apparatus, trousers, Harris & Stern ... 550,827
Measuring instrument, electrical, H. C. Parker ... 550,841
Metal wheel and making same, W. P. & J. W. Bettendorf ... 550,815
Metallic surfaces from corrosion, composition for protection of, M. D. Fleming ... 550,714
Meter. See Electric meter.
Mill. See Sawmill.
Mining machine, E. S. McKinlay ... 550,895
Moistener for envelopes, stamps, etc., A. M. Osmun ... 550,763
Motor. See Hydrocarbon motor.
Mule, self-acting, G. C. Hawkins ... 550,790
Music box, L. Gagnaux ... 550,786
Musical box, A. Junod ... 550,917
Nozzle, C. H. Phillips ... 550,643
Nut and making same, lock, J. C. Richardson ... 550,898
Nut lock, W. Case ... 550,905
Oil burner, C. Whittingham ... 550,704
Oil supplying device, C. Mascbmeyer ... 550,932
Oils, purifying solvent extracted, H. Frasch ... 550,716
Oleaginous matter from solvents, apparatus for separating, J. F. Lester ... 550,628
Ordnance, breech mechanism, L. L. Driggs ... 550,602
Ordnance, pneumatic recoil check for, H. A. Spiller ... 550,654
Organ reed voicing machine, C. N. Rand ... 550,644
Packing, metallic, E. M. Hedley ... 550,755
Padlock, permutation, J. H. Whittington ... 550,668
Paper building block, W. T. Jefferson ... 550,793
Permutation lock, J. W. Packard ... 550,641
Permutation selector, A. B. Strowger ... 550,658
Photographic developing apparatus, E. N. Dickerson ... 550,599
Photographic posing chair, M. C. Burr ... 550,588
Pile covering, C. H. Staniforth ... 550,927
Pipe cleaner, waste, F. H. Hoyt ... 550,914
Pipe wrench, M. H. Riza ... 550,693
Planter clutch, corn, G. S. Gundersen ... 550,826
Plating, dynamo-electric machine for, W. M. Thomas ... 550,663
Plow fifth wheel attachment, A. F. Jackson ... 550,931
Plow, gang, H. Sommerfeld ... 550,651
Pole hound, C. A. Allen ... 550,769
Press. See Baling press. Filter press. Printing press.
Printing metal sheets, delivery device for litbographic presses for, M. Auerbach ... 550,813
Printing press, color, W. C. Wendte ... 550,735
Pump valve, R. G. Stone ... 550,730
Punching machine, multiple, E. B. Stimpson ... 550,805
Rack. See Hat and coat rack.
Railway cattle guard, H. M. Jack ... 550,915
Railway cattle guard, J. M. Lee ... 550,759
Railway crossing, S. J. Austin ... 550,770 to 550,772
Railway gate, G. A. Reynolds ... 550,726
Railway gate, automatic, J. F. Small ... 550,649
Railway mechanism, cable, L. J. Hirt ... 550,616
Railway spike, J. A. Markoe ... 550,795
Railway switch, automatic, A. G. Lawrence ... 550,926
Railway switch, automatic electric, R. V. Cheatham ... 550,868
Rake. See Hay rake.
Recorder. See Time recorder.
Refractometer, H. L. De Zeng, Jr ... 550,747
Regulator. See Temperature regulator.
Ring. See Swinging ring.
Rotary engine, G. Brambel ... 550,582
Rotary engine, J. D. Keller ... 550,721
Rubber boot leg, C. W. Eastwood ... 550,604
Rubber overshoe, W. B. Kinsley ... 550,829
Safe, J. P. Hallenbeck ... 550,717
Salter device, automatic stock, W. F. Lawler ... 550,758
Sand drier, J. H. Finlay ... 550,824
Sand drier, D. E. Moran ... 550,798
Sash balance, J. M. Smelser ... 550,650
Sash balance and holder, J. M. Glick ... 550,752
Sash bar, metallic, A. J. Timoney ... 550,807
Sawing machine, veneer, E. Myers ... 550,637
Sawmill, G. W. Gray ... 550,825
Scraper, W. Davy (r) ... 11,516
Seal lock, T. Mounce ... 550,634
Seat indicator, sliding, W. B. Peet ... 550,642
Separating and amalgamating apparatus, G. W. Fitts ... 550,608
Separator. See Steam separator.
Sewage, device for removing, separating, and filtering, G. A. Alger ... 550,738
Sewing machine feed mechanism, J. F. Hardy ... 550,930
Sewing machine presser foot, shoe, E. F. Mower ... 550,761
Sewing machine shuttle cop holder, S. W. Wardwell, Jr ... 550,701
Sewing machine welt guiding device, F. W. Merrick ... 550,760
Shade roller bracket, C. H. Whitmore ... 550,901
Shaft, dumbwaiter or elevator, H. A. Winkopp ... 550,810
Shafting hanger, horizontal, J. J. Busenbenz ... 550,569
Shelf, swinging or hanging, J. Kunkel ... 550,830
Ship, J. Bluemel ... 550,580