

mon stroke is 18 inches. The development of 5,600 horse power is expected when the engines are making about 400 revolutions per minute.

Steam will be furnished by four Seabury water tube boilers. Each boiler will be equipped with two furnaces. The working pressure will be 250 pounds to the square inch. As arranged, there will be two fire-rooms. Each boiler will have its own funnel, making four in all.

All steam pipes are to be constructed of steel, and all pipes leading into the bilge must be constructed of copper. The hull plates, frames and angle irons below the water line will be galvanized. The metal used in the construction of the "Bailey" will be so thin and light that no portion of it can be afforded to be wasted in rust. Although galvanizing is commonly under-

stood to weaken metal, it is deemed safer to accept this initial reduction in strength than to trust to the uncertainties of water action and untreated plates.

In the crew space forward there will be folding berths for thirty-three men. Of this number, eight will be for the machinists. The officers' bunks will be Pullman car berths, fitted into the sides of the boat, aft in the wardroom.

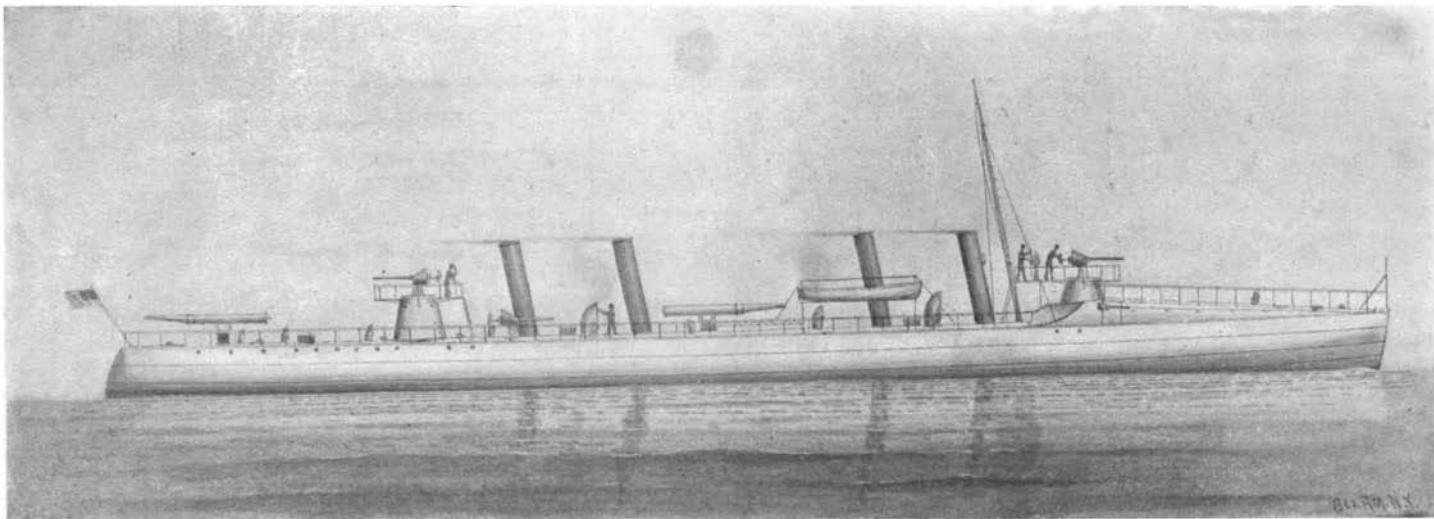
The Bailey, like the Dupont and Porter, will be able to do battle with battleships after the fashion of torpedo boats. When thus engaged she will have recourse to her torpedo tubes. But, as above shown, the principal duty of the new craft will be to drive off and annihilate with gun fire the torpedo boat torments of the battleships and cruisers. Speed alone will enable the Bailey to do this, and this speed the catcher is ex-

pected, by reason of her size, to maintain in a high sea.

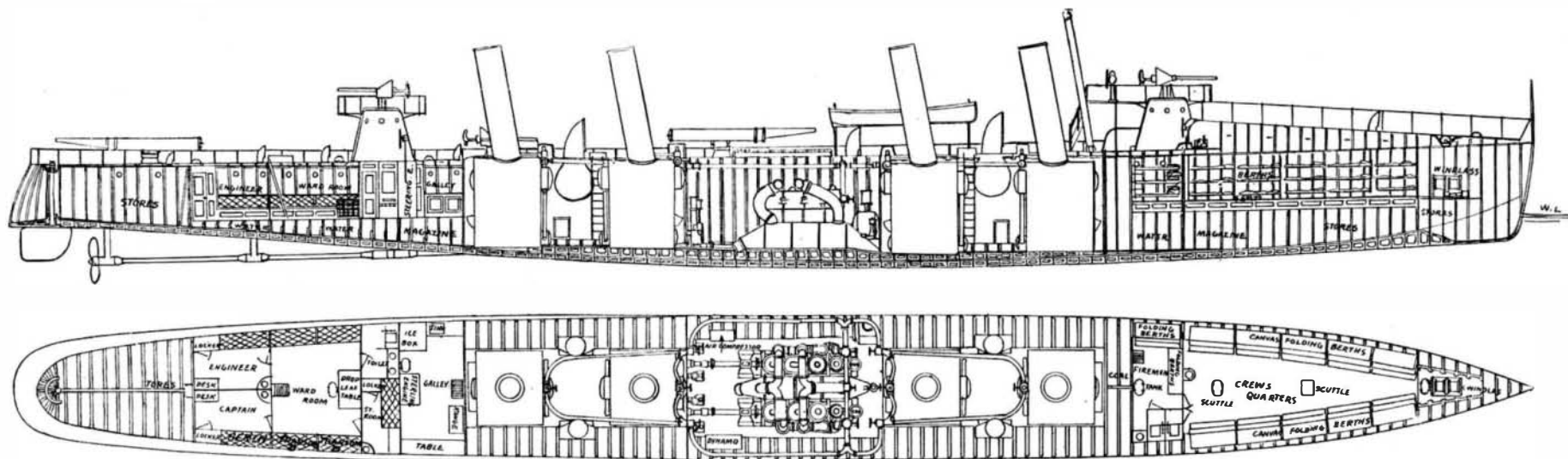
The Bailey is essentially a seagoing vessel. Her bunker capacity is deemed sufficient to enable her to steam three thousand knots at economical speed. In time of war she may be expected to accompany the battleship fleet, and to serve both as a scout and defense for the heavier vessels.

From the price to be paid for the Bailey, it will be seen that a torpedo boat catcher is an expensive craft. A torpedo boat possessing a speed of twenty-three knots per hour can, nowadays, be turned out for about \$75,000.

The inspection work on the Bailey for the navy department is in the hands of Passed Assistant Engineer Carr, United States navy.



THIRTY KNOT TORPEDO BOAT CATCHER 'BAILEY,' BUILDING AT NEW YORK FOR THE U. S. GOVERNMENT.



LONGITUDINAL SECTION AND PLAN OF THE "BAILEY."

RECENTLY PATENTED INVENTIONS.

Engineering.

ROTARY ENGINE.—Ward B. Story, Freehold, N. Y. Two patents have been granted this inventor for an engine in which abutments are mounted to swing on a cylinder, folding into recesses in the cylinder wall, and resting with their free ends against shoulders on the cylinder heads, a piston revolving in the cylinder having a fixed head extending in its working chamber, and the hub of the cylinder having inlet and exhaust ports. The arrangement is such that the steam is cut off during a part of the revolution to allow it to act expansively in the cylinder on the piston head, to which two impulses are given during every revolution of the main shaft. The piston may also have a plurality of piston heads, in connection with a series of movable abutments in the cylinder, a rotary valve connected with the supply and with an exhaust being adapted to connect with a series of ports leading into the cylinder, each port forming alternately an inlet and an exhaust port.

Railway Appliances.

RAILWAY SIGNAL.—John D. Taylor, Chillicothe, O. This invention relates to highway crossing signals provided with an electric bell which is automatically thrown into circuit by an approaching train and cut out of circuit by the train when it passes the crossing, the invention being designed to simplify such apparatus and reduce to a minimum the cost of construction and maintenance, while also lessening the liability to derangement.

Bicycles, Etc.

SADDLE.—David Basch, New York City. This saddle is made with a removable and interchangeable cushion at each side of its center, the cushions being held firmly in connection with the body of the saddle by a tie plate secured to the saddle body. The cushions are also provided with removable covers, held on by means of the tie plate, the cushions being light, durable and elastic, and resuming their original shape the moment they are relieved from pressure. All the parts of the saddle are readily and quickly dismantled and as readily assembled.

BICYCLE AIR PUMP.—Albert S. Noonan, Rome, N. Y. An air pump which may be con-

veniently operated by one hand is provided by this invention, the pump having the usual cylinder and piston, mounted on an outwardly extending stem to which is attached a handle, and the cylinder having a reduced outlet with which is connected a flexible tube, the other end of the tube being provided with a holder for attachment to the valve leading through the rim into the tire. The flexible tube allows the pump to be engaged with the valve nipple while the body portion of the pump is at a slight incline relatively to the wheel, the pump being held rigidly in place by the adjustable holder.

DEVICE FOR LOCKING BICYCLES.—Emil Buebel, of Altoona, and Jack Hall, of Juniata Kipple, Pa. This is a device for application to the front fork to prevent the wheel from being turned to the right or left, thereby preventing the unauthorized use of the machine. The lock is applied to the lower head tube fitting, adjacent to the crown of the forks, and the locking device proper and adjuncts are inclosed in a thin metal casing detachably secured to the fitting, the locking bolt sliding vertically, and its lower end when depressed entering a socket in the cone or fork crown bearing, thus locking the fork so that the front wheel cannot be turned to the right or left.

Mining, Etc.

PORTABLE GOLD WASHER.—Felix Kahn, Laredo, Texas. According to this improvement, two rotatable basins are mounted one above the other on a spindle or shaft held in suitable bearings in a small tank, means being provided for breaking up clods and stirring the pulverized ore as the basins rotate and also for discharging the liquid contents of the tank as required. The basin, spindle and connected parts are adapted to be easily removed from the water tank, and mercury may be placed in the basins to amalgamate the free gold. The device is particularly adapted for use by prospectors and in laboratory work.

AUTOMATIC DUMPING CAGE.—William K. Gordon, Thurber, Texas. For use in the shafts of coal mines, etc., this inventor has devised a platform so made and hung as to avoid pounding and racking of the guides and tower building, the platform turning on a true circle. Means are provided for automatically restoring the platform to a horizontal or carrying position after it has been dumped, locking the platform, and

automatically unlocking it for dumping. The platform may be made to dump at either end, and provision is made to prevent the spilling of coal from the car into the shaft.

Mechanical.

ROUND BAR ROLLING MILL.—Paul J. Delay, Boucan, France. For making straight shafts or axles, and shafts of varying diameter, this mill is made with a series of rollers surrounding a central space adapted to receive the blank, slides carrying the rollers and being arranged to move radially in the frame of the machine, the rollers being carried bodily by the slides so that during the movement of the slides the axes of the rollers remain parallel to their original positions. Means are provided for moving the slides radially with the rollers, and for rotating the rollers while they are being moved inward against the blank. A hollow blank may be worked by inserting in it a mandrel, and blanks of original polygonal cross section may be worked in the mill.

SHAFTING COLLAR.—Heinrich Meltzer, Ratibor, Germany. An abutment ring or collar for shafting, to diminish the friction between bearings or loose pulleys, is provided by this invention, the collar having an exterior groove at one end forming a neck in which is a channel ring in which are located anti-friction balls. The channel ring bearing against a loose pulley permits the latter to turn independently of the shaft and at the same time holds the pulley from sliding on the shaft.

PATCHING SAWS.—Michael D. Ahearn, Green Bay, Wis. For cutting or grinding a concave recess in the side of a metal plate for the purpose of patching fractures in saws by brazing across such places cross sections, this inventor has devised a machine comprising horizontal guide rods on which slides a non-rotary frame, an oscillating frame being arranged within the non-rotary frame and carrying a horizontal shaft with drive pulley and cutting wheel, there being means for vertically adjusting this shaft and wheel.

SANDPAPERING MACHINE.—George C. Bonniwell, Hickory, N. C. A machine more especially designed for sandpapering the edges of door panels, etc., is provided by this invention, the machine having abrading disks with oppositely arranged abrading faces, and permitting of readily fastening the paper to the

disks. The invention provides for a disk with inner and outer beveled edges, and clamping devices for holding a sheet of sandpaper on the edges, the disks being free to yield according to any unevenness in the work, to insure a proper and smooth sandpapering of opposite faces.

MECHANICAL MOVEMENT.—Sumpter L. Harwood, Uniontown, Ala. To transform reciprocating into rotary movement, and vice versa, this invention provides a shaft divided into two sections, each section being spirally grooved, but in opposite directions, a collar engaging each of the sections, and means being provided for moving one relatively to the other, and at the same time preventing the rotation of the collars except in one direction. The device possesses the advantage of having no dead center, and the stroke of the reciprocating member may be varied without affecting the rotation of the shaft.

NUT LOCK.—Townson Hand, North Vernon, Ind. According to this invention, any attempt to unscrew a nut on which this lock is employed will cause a cam member of the lock to rotate and bind firmly against the nut. The device comprises a fixed member having an inclined surface concentric with the bolt opening, and upon which rests the inclined inner surface of an annular locking cam, adapted to rotate and ride up the incline on the fixed member, and wedge firmly against the inner face of the nut, whenever the nut is turned in a direction to unscrew it.

PAPER WINDING MACHINE.—William H. Decker, Rumford Falls, Me. A machine more especially designed for use with machines for making wide paper has been designed by this inventor, the machine being arranged to relieve the winding shaft of its load, to prevent the shaft from springing, and, consequently, prevent irregular winding. Sliding bearings are provided for the shaft on which the paper is wound, and a supporting drum adapted to support the paper on the shaft is journaled in bearings fitted to slide at an angle to the line of movement of the shaft. The device is simple and durable and entirely automatic in its operation.

EDGE SETTING MACHINE.—Adam H. Prenzel, Reading, Pa. For setting and polishing the edges of the soles of boots and shoes, this improved machine affords a novel construction, arrangement and adjustment of the reversible head carrying the setting and polishing tools. The arrangement is such that two tools may be alternately brought into use or thrown out in a very convenient and practical manner;

and, if desired, a hand rest may be employed below the shoe to hold it steady in turning the tool, a lamp or gas flame being placed adjacent to the tool not in use for alternately heating the tools.

Agricultural.

ANIMAL CLEANING DEVICE.—Orson P. Fretwell, Cedar City, Utah. This device comprises a rotary brush mounted in a framework in which is also mounted a gear wheel and connections, with a rubber or similarly covered tire on one or more operating wheels, the rotary brush being operated by pushing the device along in contact with the animal's body.

CANE PLANTER.—Jacob C. D'Azevedo, Brooklyn, N. Y. This invention relates to machines in which the operations of making a furrow, planting the cane, and covering the furrow are accomplished in successive and closely following steps, the machine facilitating the planting of cane of any desired length, planting the cane in multiple in the same furrow, and dropping the various pieces simultaneously.

CONNECTING ROD FOR REAPERS. MOWERS, ETC.—Daniel J. Crosby, Kadina, South Australia. This rod is designed to facilitate actuating the knives of reapers and mowers, etc., in such a manner that, when obstructions are met with, the connecting rod, which converts the rotary into reciprocal motion, shall lengthen or shorten, and thus avoid breaking of the knife or other part of the machine.

BAND CUTTER AND SELF-FEEDER.—Henry J. Fournier, Hazelton, Iowa. This machine is separate and distinct from a thrashing machine, with which it is connected only when it is desired to automatically feed the grain to the feeder of the thrasher.

Miscellaneous.

PHOTOGRAPHIC CAMERA.—Daniel P. O'Leary and Samuel B. Kull, New York City. This invention covers an improvement upon a formerly patented invention of the same inventors, in which the movement of the film is automatically controlled by a shutter mechanism.

TRANSFERRING DESIGNS.—William R. Fish, Brooklyn, N. Y. To facilitate taking prints from lithographic stones or metal, etc., and converting them into sensitive transfer sheets, regardless of the age of the print or the number of times it has been used, this invention provides for first treating the sheet or film containing the drawing or design with a mixture of water and albumen, gelatine or one of the mucilaginous gums, then washing in water, then treating it with a greasy or printing ink, and then transferring to a stone, plate or printing surface.

GAS GENERATING MACHINE.—Frank A. Hutter, New Haven, Conn. This machine is designed to make gas for illuminating or heating purposes, and has a cylindrical generator, with perforated partitions, and packed with an absorbent material, the generator being mounted to be partially rotated occasionally, to facilitate the complete combustion of heavy oil.

SPRAYER.—Jules Bengue, Paris, France. This invention relates to devices for spraying ethyl chloride and other volatile liquids, employing therefor a capillary discharge opening with a protecting filter, but instead of the ordinary closing valve having a movable plug, a washer is used of suitable soft material, inclosed in a metallic cap.

MOVEMENT OF FLUID IN PIPES, ETC.—Orville Carpenter, Pawtucket, R. I. This invention relates to fire sprinklers and other apparatus containing a fluid normally dormant, but adapted to flow when a valve or other device is opened, and to apparatus containing a fluid normally in motion and liable to have its flow interrupted.

RESERVOIR PEN.—Carl J. Reitz, New York City. This pen has a tapering tubular shaft open at its inner end and provided with barriers, and an integral tongue extending beyond an opening at the branch

ing of the nibs, it being designed so to construct an ordinary writing pen that, at one dipping of ink, it will take up and retain sufficient of the fluid to accomplish the writing of one or more letters of medium length without the necessity of a second supply.

CASH RECEIPT.—Alpheus C. Sine, Stanford, Ky. At the foot of the main casing of this receptacle is a drawer, over which is a casing supporting a shell which holds a rotary coin carrier, where coins may be placed or from which they may be removed at will, the upper casing holding gearing by which the coin carrier is operated, and the base casing carrying a receptacle for notes and also an alarm mechanism by which notice is given when the apparatus is operated.

AXLE BOX.—Franz A. Surth, Dortmund, Germany. This invention provides novel forms of plates and ring to constitute a closure for the space between axles and the walls of the openings in axle boxes, through which openings the axles pass, the closures serving to prevent the passage of dust in such spaces and also preventing the escape of the lubricant from the axle box.

KITCHEN TABLE.—Rudolph J. Hentze, Jersey City, N. J. This table is provided with a bin for holding flour, etc., protecting the contents from insects and dust, the bin being also placed in the table as not to interfere with the ordinary use of the table.

SHOESTRING HOLDER.—Henderson T. Small, Chanute, Kansas. This is a simple device, composed of a bracket having at one end a screw shank, the bracket being provided with a contact surface and with an elastic band sprung into seats thereon.

FENCE WIRE STRETCHER.—John W. Schaal, Logan, O. The wire clutch mechanism embraced in this invention comprises a bar to which a series of clutches is attached, a tension bar and arms being attached to the bar and pivotally connected to the clutches, the apparatus being adapted to stretch one wire or to stretch several wires simultaneously.

FLUTE.—Carlo T. Giorgi, New York City. This flute has a mouthpiece curved in direction of the length of the flute, with a mouth hole on its top and a resonating chamber extending below the line of communication between the mouthpiece and the body of the flute.

LOCK FOR FLUSHING VALVES.—Charles H. Shepherd, New York City. Combined with the flushing valve lever, according to this invention, is a lock which engages the lever when it is raised and holds it in elevated position until released by the descent of the float ball of the supply pipe.

FIREPROOF FLOOR CONSTRUCTION.—Francis Omels, Moultrieville, S. C. As an improvement in steel frame buildings, this invention provides for hangers suspended from the floor beams, auxiliary beams whose ends enter the hangers and are supported thereby between adjacent beams.

BIN.—Walter Thomas, Palatka, Fla. This invention provides an improved bin for granular foods, the bin having a novel arrangement of a number of compartments in one entire and inseparable structure, the elements of which are very closely combined.

LEMON SQUEEZER.—William H. Cox and Charles Hughes, Red Bluff, Cal. This is a simple and inexpensive device with which, by a single movement, the operator may cut a lime or lemon and extract the juice.

MERRY-GO-ROUND.—Thomas T. Temple, Paris, Ky. This is a circular swing of simple and cheap construction, to be operated by one of the riders, and consists of two seats suspended from the ends of a pivoted beam, there being means by which one of the riders may be shifted in relation to the central post.

NOTE.—Copies of any of the above patents will be furnished by Munn & Co. for 10 cents each. Please send name of the patentee, title of invention, and date of this paper.

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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.

(7272) G. B. C. asks: 1. Can the 3 or 6 inch call bell be worked by the incandescent light wires (current about 104 volts), or should the magnets be wound especially for that purpose?

(7273) J. L. T. says: Can a meerschraum pipe be cleaned so that it will color again by boiling in milk, or otherwise, and what is the process?

(7274) F. H. asks: 1. How many bichromate of potash batteries will it take to magnetize the field of the little alternating current dynamo of SCIENTIFIC AMERICAN, September 11, to light two or three 16 candle power 110 volt lamps?

(7275) O. J. asks how to make a good strong battery to use with a gas engine and to run small motors, and if there is any advantage in using copper in the place of carbon.

(7276) L. S. asks for a formula or formulas for flash light powder, for use in photography, which can be set off with fuse, and work with a minimum of smoke and noise?

(7277) C. W., writing about the small alternator recently published in the SCIENTIFIC AMERICAN, asks (1) whether the ring and armature core can be cast with as good results?

pounds of wire No. 20 double cotton covered in 12 layers, 120 feet for each spool. Armature teeth must be wound with four even layers of No. 22 double cotton covered magnet wire, about 2 pounds in all, approximately 80 feet on each prong.

NEW BOOKS, ETC.

THE AMERICAN ANNUAL OF PHOTOGRAPHY AND PHOTOGRAPHIC TIMES ALMANAC FOR 1898. Edited by Walter E. Woodbury. New York: Scribner & Adams Company, 1898. Pp. 370. 8vo., 300 illustrations. Price 75 cents.

This annual, now the twelfth of the series published, appears this season embellished with a beautiful collection of the latest and best examples of process work, and is typical of the progress that has been made in this line. The book is replete with many useful articles and hints representing the experience of well known writers on photography, particularly as regards its relation to the amateur worker.

CENTRIFUGAL ANALYSIS. A manual for the use of the centrifuge in everyday work. Illustrated. Rochester, N. Y.: Bausch & Lomb Optical Company. Pp. 36. This neat pamphlet is supplied gratis to persons interested in the centrifugal analyses of water, milk, urine, blood and other liquids or semi-liquids.

TO INVENTORS.

An experience of nearly fifty 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 in both countries, and to possess unequalled facilities for procuring patents everywhere.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

DECEMBER 7, 1897,

AND EACH BEARING THAT DATE.

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

Table listing inventions with patent numbers and names of inventors. Includes items like Alarm device, electric, Fitz Gerald & Fay; Armature for dynamo-electric machines; Asbestos, manufacturing mouldable mass; Automatic signal, C. B. Hunter; Axle box, car, Sheehan & Laun; Baking, cooking and heating furnace, O. K. Harry; Balance, postal, H. B. Seaman; Bath, See Needle bath; Battery, See Electric battery; Bearing, anti-friction, G. O. Gridley; Bearing for axles, ball, N. Russelle et al.; Bearing, shaft, J. W. Smith; Bed bottom, spring, W. S. Simpson; Bed brace, S. R. Payne; Bed, invalid, B. Bennett; Beds, device for holding covers on, H. D. Viser; Bell, bicycle, F. A. Glines; Bell, bicycle, A. L. Taveau; Belt, F. C. Missinger; Bicycle, A. C. Fairbanks; Bicycle, J. M. Gilbert; Bicycle brake, L. C. Hall; Bicycle brake, O. Kraus; Bicycle frame, L. H. Cobb; Bicycle frames, construction of, Beranek & Chobert; Bicycle luggage carrier, I. N. Linceo; Bicycle luggage carrier, W. H. Logan; Bicycle or velocipede driving device, W. Wanless; Bicycle saddle, J. A. Hunt; Bicycle support, G. W. Prentice; Blind, Venetian, R. Churchill; Blowpipe, C. A. Webster; Boiler, See Steam boiler; Boiler attachment, W. I. Miller; Boiler setting, L. Bernhard; Bolt, L. H. Bigelow; Boring machine table, Poertner & Fix; Bottle, Serib & Carroll; Bottle and stopper, non-refillable, G. W. Shailer; Boundary stone, C. Branzke; Box, E. Oldenbusch; Box filling machine, J. P. Wright; Bracket, C. F. Deebler; Brake, See Bicycle brake; Brake shoe and wheel dresser, W. E. Gorten; Brush, scrubbing, P. F. Barrett; Butter, etc., device for cutting, weighing and measuring, L. H. Davis; Buttons, fastening heads to posts of collar, R. E. Byrne; Calculating machine, E. V. Williams et al.; Camera, photographic, E. Bloch; Can, See Sheet metal can; Canopy, O. H. Basquin; Car coupling, C. J. Greiner; Car coupling, J. La Burt; Car door, J. M. Smith; Car draw bar platform, railway, T. L. McKeen; Car fender, Brown & Smith; Car fender, Dickerson & Towne; Car fender, Jarvis & Jones; Car fender brake actuating mechanism, Ferguson & Gibson; Car fender, street, C. D. Berman; Car fender, tramway, W. J. Calvert; Car section partition, sleeping, Reese & Willis; Car, stock, I. Davison; Car ventilator, A. J. McArthur; Car vestibule, railway, T. L. McKeen; Cars, controller for meters and brakes of electric, A. Grossman; Carding engines, grinding mechanism for flats of traveling flat, C. Whitaker; Carriage attachment, baby, C. Blakely; Carriage body hanger, S. H. Bailey; Carriage, holding child's, J. L. Crowley; Carriage top support, E. Galloway; Case, See File case; Caster case, L. B. Denton; Centerboard for boats, etc., J. W. Gibb; Chain and chain link, H. B. Morris; Chart, dress, M. D. Lee; Chimney cowl, J. W. Hunt; Chuck, C. L. Teske; Churn, J. Wegeman.

(Continued on page 397)