Correspondence.

The Isthmian Canal Problem.

To the Editor of the SCIENTIFIC AMERICAN:

The editorial in your issue of the 10th inst. seems a little severe on the pending action of Congress upon the Nicaragua Canal problem. If any affront has been given anybody, it was given by Congress at its last session, when, without waiting for a report already being made, by a commission appointed by its authority, it ignored the work of the commission, then two-thirds completed and soon to be reported, and enlarged the commission by adding five members, thereby assuming that the Walker commission was either incompetent, or laggard, or both. This looks like an affront both to the President and the commission. "A decent respect for the opinion of mankind" should have allowed the commission to report before superseding them, and if Congress had been less hasty, the new commission would never have been appointed, for the Walker commission has thoroughly settled the question of the feasibility of the Nicaragua Canal and its extreme cost. No doubt $100,000,000 will cover the entire cost.

The commission has greatly enlarged on the Menocal plans, by an average prism nearly 75 per cent greater, has located the canal in the coastal plain and San Juan Valley, where it ought to be, puts the San Juan dam above the mouth of San Carlos River, which is the right thing to do, plans to regulate the lake level and locates the west side to the Pacific wisely and well. The great divide cut, the long and high embankments, the great dams and embankments at Deseado and La Flor, and the excessively high lift locks of the Menocal plans, are all wisely eliminated. What more can you ask? You say the great problem of regulating the lake level has not been solved. Well, what about the Panama project, where there is not a drop of water at the summit to regulate, and the tremendous freshets of the Chagres River have puzzled the engineers from the beginning, and the problem has not been solved to this day?

It is strange that you doubt the ability of our engineers to regulate the outflow of water from Lake Nicaragua, when the Chicago Drainage Canal is so easily regulated at pleasure by the rise and fall at will of the "bear trap dam," 160 feet in length. So too on the 3d page following your criticism of Congress, you exploit the "balanced cantilever" and show that a single machine handled 900 cubic yards in a day, raised it out of a cut 36 feet deep, and deposited it in a spoil bank 80 feet high. This is just the thing for the 12-mile cut west of the lake, quite similar in width and depth to the rocky portion of the drainage canal, and this is only one of the many ingenious modern appliances for handling material in wide and deep cuts. The commissioners add 50 per cent to drainage prices, for the excavation west of the lake, then add 6 per cent for administration, then add 20 per cent to that to make up their $118,000,000. Do you doubt that there are plenty of contractors that will be glad to do the work at those prices?

But suppose the canal costs $135,000,000, the highest that any authority has ever put the cost. Who would grumble? Nobody in this part of the dominion, I assure you. Everybody is unanimous for the Nicaragua Canal, and for its speedy construction, for it is by far our shortest route, and best route. Longer dilly-dallying is nonsense. No doubt that it will be of immense importance to the commerce of the United States and of the world, and as a paying investment it will outclass the Suez Canal. O. B. GUNN.

The Montague, Kansas City, Mo., February 12, 1900.

[We cannot agree with our correspondent in his suggestion that the appointment of the Isthmian Canal Commission before the presentation of the report of the Walker Commission was any reflection upon the latter body. The Walker Commission was concerned with the Nicaragua route and no other; whereas the President decided, wisely, as it seems to us, that before the country was committed to actual construction it would be prudent to determine which of the several possible routes was the best; and to this end the Isthmian Canal Commission was appointed. Such an examination is called for by the dictates of common prudence, and it is indorsed by everyday practice in the construction of our railroad systems, where several "trial lines" are almost invariably run before deciding upon a "final location."

The SCIENTIFIC AMERICAN desires to see the canal built and owned by the United States; but we want that canal to be the very best that can be built. So long as the location decided upon insures, more than any other, the advantages of short length, ease of access, permanence of structure, and low cost, we care not whether it is located at Panama, Nicaragua, or elsewhere at the Isthmus. That Nicaragua combines all these advantages, or that it combines them in greater degree than any other route, has yet to be proved. If the present Commission says that it does, we shall heartily welcome its immediate construction.—ED.]

Automobile News.

A new service of automobile cabs will be introduced in Paris.

Very satisfactory results are being obtained in Washington in the collection of mail from street letter boxes by means of automobiles. On one of the longest routes in the city the automobile covered the distance in thirty-two minutes, including twenty-seven stops. The regular collector's time for this trip is one hour and forty-five minutes, and with a horse-drawn vehicle one hour and twenty minutes.

The Current Supplement.

The current SUPPLEMENT, No. 1260, has many interesting articles. "Are Further Experiments Needed for Determining the Atomic Weight of Oxygen?" is by Edward W. Morley. "An American Pacific Cable" is the address delivered before the American Institute of Electrical Engineers by George Owen Squier, and is concluded in this issue. "The Electrical Potentiality of Atmosphere Referred to Other Conditions" is an interesting artcle by Professor Edwin G. Dexter, Ph.D. "The Man's Knife Among the North American Indians" is by Professor Otis T. Mason, and it is accompanied by seventeen illustrations. "The Cruise of the 'Albatross,'" by A. Agassiz, is concluded.

Contents.

(Illustrated articles are marked with an asterisk.)

RECENTLY PATENTED INVENTIONS.

Agricultural Implements.

CUT-GRAIN CARRIER FOR HARVESTERS.—HENRY BRYAN, Modesto, Cal. In headers the endless draper or apron runs on a roller arranged directly behind the sickle-bar and at a right angle thereto. The lower end of the roller, being near the ground, accumulates sand which increases the friction. To overcome this objection, the inventor forms the roller with a hollow, cylindrical body. Circular heads have a central interior and concentric interior flange fitted within, with a shoulder abutting the end of the latter. Coincident oil-holes are provided in the body and one of the heads to insure perfect lubrication.

COTTON-CHOPPER.—HENRY BARTELS and LOUIS BERNHARD, New Braunfels, Tex. This improved cotton-chopper can be readily attached to a cotton cultivator; the chopping knives can be easily secured at any desired place on the periphery so that adequate spaces are left between sets of knives for the purpose of passing over the stalks at desired intervals. The cotton-chopper comprises a wheel comprising connected disks, formed in their adjacent and inner faces with series of recesses undercut toward their opposite and outer faces. The chopping-knives have their ends fitted in the recesses.

MOWING-MACHINE ATTACHMENT.—THOMAS B. FAGAN, Van Wert, Ohio. This attachment is designed to be secured in the rear of the finger-bar of any machine for the purpose of gathering the grass or clover into bunches and discharging the bunches behind the truck of the mower, where they are out of the team's way on the next round. The gatherer consists of parallel slats turned up at their rear ends on a diagonal line. A gate is provided composed of an arm having pendent teeth or tines arranged along the line of draft parallel with the delivery side of the gatherer, the arm being made adjustable to be lifted from the gatherer to discharge the bunch of grass.

Electrical Apparatus.

ELECTRIC-LAMP SUPPORT. — HARRY LONG, Greentown, Ind. This device, composed partly of aluminum, is especially adapted for railway stations, hotel corridors, boulevards, and places where arc-lamp fixtures of tasteful design are required. The inventor has furthermore provided a very simple and ingenious means for supporting a lamp and for raising and lowering it, so arranged that upon lowering the lamp, the electric current is automatically cut off, so that the carbons can be renewed without danger.

Engineering-Improvements.

TRACTION-ENGINE.—AMBROSE M. SEARLE, Geneseo, Ill. The construction provides a pivotal connection for attaching one end of an adjustable two-wheel base to a traction-engine, thus making it possible to sustain the weight of that end of the adjustable base and also the weight of the load which may be carried upon that part of the base, at the same time allowing the engine perfect freedom in the movements as regards its steering or guiding apparatus and in the performance of its other operations. The action and position of the boiler of the engine control the guiding device of the two-wheel base. The base is so arranged as to travel in front of, instead of trailing behind the engine, as a result of the positive operation of the steering devices by the movements of the boiler.

MACHINE FOR MEASURING OR LAYING OUT SLIDE-VALVES.—PETER ELLIS and ARCHIBALD A. WHITELAW, Wellington, New Zealand. This improved device enables anyone readily to find, without further calculation, the angle of cut-off, the lead, and the linear dimensions of ports, the lap, and the angle of advance of the eccentric.

COMBUSTION-ENGINE. — JAMES L. BAILLIE and PERLEY B. VERITY, Shawnee, Ohio. This combustion-engine employs a driving-wheel of the turbine type and uses gas, oil, air, or steam as a motive agent. The gas, oil, or other element is used expansively, being ignited or exploded in a separate vessel, the resulting gases being conducted to the driving-wheel of the engine, thus providing a more steady and uniform pressure than when the elements are exploded directly within the engine.

Mechanical Devices.

SHEET-FEEDING MACHINE.—LEWIS E. MORRISON, Kensington, Conn. The invention provides a simple form of suction separating mechanism adapted to carry paper to the separating mechanism and the feed of the machine to which the attachment is applied. The mechanism automatically contracts and separates the lowermost sheet from a pile of paper and directs the selected sheet to any machine, device, or receptacle adapted to receive it and also effects such separation and delivery so that the paper is not buckled or subjected to undue strain or pressure.

FEED-ATTACHMENT FOR WOOD-PULP CHIPPERS.—SAMUEL W. BUTTERFIELD, Three Rivers, Quebec, Canada. The invention is a machine for reducing timber to chips, before transforming them by the aid of chemicals into wood-pulp. The invention provides a new and improved feed attachment for pulp-wood chippers for feeding timber to a revolving knife-wheel, for the knives to cut chips of uniform thickness, which is essential to a proper disintegration when the chips are subjected to the action of the chemicals to insure the production of a high grade wood-pulp.

FENCE-WIRE FASTENING DEVICE — OSCAR D. WOODBURY, Rochester, N. Y. The inventor has devised an apparatus for fastening stays to the running-wires of wire fences. The fastening is effected by clenching a staple around the wires at their juncture and by slightly crimping the wires, so that the staple can more effectively engage and hold them in the proper relative position.

POWER-TRANSMITTER FOR WINDMILLS. — FRED C. THOMPSON, Burton, Wash. The power-transmitter comprises a wind-wheel loosely turning on a shaft. Independent ratchet-wheels are mounted to rotate loosely. A centrifugal governor is mounted on the wind-wheel and controls pawls adapted to engage either of the ratchet-wheels. Planetary gearing is driven from the ratchet-wheels and connected with and controlled by the governor. The power given to the shaft is transmitted by oppositely-arranged crank-arms to pump-rods to move the latter alternately in opposite directions, so as to insure continuous pumping. The operator can conveniently throw the wind-wheel out of the wind whenever desired.

CURRENT-MOTOR. — ROBERT S. THEALL, Fort Pierre, S. D. The current-motor is designed for the utilization of the power of a flowing stream, ocean-tides, etc., and comprises a float having a post at one edge, with a mast mounted to turn upon the post. A series of sweeps or rotating-arms extend from the mast over the float and water. Stays extend from the upper part of the mast to the outer end of the sweeps. Levers pivoted upon the sweeps carry buckets or vanes adapted to drop into the water. The levers extend above the sweeps to engage the stays as stops. An incline extends down from the float into the water and engages the vanes to raise them out of the water. The lower edges of the vanes have rollers engaging the platform and float and supporting the vanes during one-half of their revolution.

REVERSIBLE CLUTCH-MECHANISM. — FRANZ SCHNEIDER, Lawrence, Mass. The main object of the invention is to provide a device for connecting the axles and wheels of motor-vehicles so that the wheel can turn faster than the axle, nevertheless enabling the axle to engage the wheel to turn it positively when the speed of the axle is equal to that of the wheel. The device is made so that it can connect the axle with the wheel to turn the wheel either forward or backward, and that it can be set so as to be disengaged entirely from the wheel, enabling the wheel to turn in either direction.

Railway-Appliances.

CAR-BRAKE. — CHARLES E. SHARPLESS, Dubois, Penn. This brake is especially adapted for mine cars, but is also applicable to other vehicles. It is so constructed that it is capable of automatic adjustment or compensation for any unequal wear on the brake-shoes or blocks, thus obtaining equal pressure of the shoes or blocks at both sides of the car. The inventor claims that there is no friction between the brake-blocks and car-wheels when the brake is not in use, so that great pressure may be applied to the brake-blocks with but a slight expenditure of power on the operating lever.

Miscellaneous Inventions.

SKIRT AND WAIST-FASTENER. — WILLIS J. GALLUP, New Richmond, Wis. The invention provides a device for conveniently and securely fastening together around the waist the two sides of a placket of a lady's skirt and also for holding the dress-waist at the back. Thus the two parts of the dress are so connected as to prevent all unsightly gaping.

CHAIN-LINK.—WILLIAM H. GRIFFITH, Baltimore, Md. This wire chain-link is of that form in which there is a loop forming one end of the link, the other end being formed by two terminal eyes brought to lie side by side to receive through them both the loop of the next adjacent link in forming the chain. The present invention consists chiefly in locking the ends of the terminal eyes in convolutions coiled in the shanks at a point near the terminal eyes and at one end of the open portion of the link.

HORSE-DETACHER.—HENRY H. and GEORGE P. THOMSON, Wakarusa, Kans. The purpose of the invention is to provide a horse-detacher applicable to single or double rigs and arranged to permit the driver or other person almost instantly to detach a horse or team from a vehicle. The singletree is mounted so that it can be given a quarter-turn. Trace-pins are pivoted on the ends of the singletree and adapted to engage apertures in the trace. Keepers are carried by the singletree, each for normally holding a pin in position and allowing the pin to swing out of the keeper to release the trace upon giving a quarter-turn to the singletree. The pin is normally spring-pressed into engagement with the keeper.

HANGING CLOTHES-RACK.—LOUIS G. HORTON, Blossburg, Penn. When set up, this clothes-rack will accommodate a number of plain pieces, as well as skirts, shirts and the like, the latter named garments being suspended from the lower portion of the device. The clothes-rack is so constructed that the articles upon one tier will not interfere with the articles upon an upper or lower tier, the rack-bars or rods upon which the clothes are hung being arranged in graduated series.

LATHE-DOG.—WILLIAM B. HANKINS, Mount Vernon, Ohio. The inventor has devised an ingenious lathe-dog which can be readily fitted to all kinds of work, obviating, therefore, the necessity of changing the dog to suit the work. The dog consists of two jaws, which can be moved toward or from each other to engage and disengage the work. The saving effected by this device is obvious.

TOBACCO-PIPE.—EMIL P. DATOW, New Orleans, La. To prevent nicotin from passing to the mouth of the smoker, the inventor forms the bowl of the pipe with a smoke-outlet in its side above the bottom of the bowl. Into a cooling and draft chamber surrounding the bowl a smoke-outlet opens. A settling-chamber communicates with the bottom of the bowl, but is distinct from the cooling-chamber. An air-circulating chamber circulates air around the cooling and draft chamber. Saliva besides being prevented from passing to the cooling-chamber, repels the oil of nicotin.

BOOT OR SHOE HEEL.—JAMES J. NAUGHTON, Manhattan, New York city. One object of the invention is to provide an attachment for boot and shoe heels whereby the wearing-surface of a heel may be removed at will and another substituted whenever desired. The invention also provides for the attachment of a tread-lift of any desired character to a heel and supplies means whereby the lift may be detached from and secured to the shoe.

APPARATUS FOR DISTRIBUTING AIR.—JAMES CURLEY, Macoupin, Ill. This apparatus is adapted for application to vehicles, and is so constructed that air may be drawn and delivered directly to various points where it is required. When the vehicle is occupied, currents of fresh air will be supplied not only to the occupants of the vehicle, but also to the animals drawing the vehicle, the bodies of the animals being simultaneously protected from the irritation of insects.

SAFETY-LOCK.—JOSEPH M. ROBINSON, Manhattan, New York city. The lock is designed for attaching a window-cleaning device or belt to a window-frame or to another nearby support. The contrivance can also be profitably employed as a safety-lock. The device is constructed in two parts, one being designed for attachment to the support, and the other for connection with the cleaning-device. No springs are used in the construction. When once in position the lock cannot be released accidentally.

AUXILIARY GENERATOR FOR OIL-GAS LAMPS.—ALEXIS F. GILLET, Kearney, Neb. In using oil-gas lamps which have a generator heated by the

burner it is necessary ordinarily to furnish some means for heating the generator to volatilize the oil. The means usually employed consist of some form of torch for heating the generator when the lamp is first ignited. The object of the present invention is to provide a carbureter operated by the attendant, which will furnish a supply of carbureted air or gas sufficient to heat the generator to its working temperature. The device may be applied to any lamp of the form using a generator heated by the flame of the lamp.

Designs.

NECK-BAND FOR VESSEL-CARRYING DEVICES.—JOSEPH RITTENHOUSE, Philadelphia, Penn. The inventor twists a wire designed to fit a milk-bottle neck so that it will be provided with two eyes which receive the ends of a bail.

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

NEW BOOKS ETC.

ELEMENTARY CHEMISTRY FOR HIGH SCHOOLS AND ACADEMIES. By Albert L. Arey, C.E. New York: The Macmillan Company. 1899. 12mo. Pp. 300. Price 90 cents.

The author has produced an excellent text book which compares very favorably with those of the same grade which we have examined. "Sulfur" never looks as well as sulphur, but it is perhaps well to bow gracefully to the new spellings, which seem to have come into chemical literature to stay. The diagrams admirably elucidate the text.

HOME PORK MAKING. By A. W. Fulton. New York and Chicago: Orange Judd Company. 1900. 16mo. Pp. 124. Price 50 cents.

The present volume is a complete guide to the farmer, the country butcher, and the suburban dweller in all that pertains to hog slaughtering, curing, preserving and storing pork product from scalding vat to kitchen table and dining room. The formulas are most practical. It is a work we can commend.

WATER AND WATER SUPPLIES. By John C. Thresh. Second Revised Edition. Philadelphia: P. Blakiston's Son & Company. 1900. Pp. 438. Price $2.

A thoroughly practical work of value to all sanitary engineers and to others who deal with water supplies. English practice is of course described; but attention has been given to the subject in England, owing to the density of the population, that it is all the more valuable on this account.

FORAGE CROPS OTHER THAN GRASSES. How to Cultivate, Harvest and Use Them. By Thomas Shaw. New York: Orange Judd Company. Illustrated. 1900. Pp. 281. Price $1.

The work has a practical ring about it that begets confidence. It will prove of immense value to every farmer who will give it careful study. Forage plants can be made to supplement perennial pastures. They are destined to occupy an important place in the near future in systematic crop rotation on every stock and dairy farm.

FORMULAS AND TABLES FOR HEATING. Being German Formulas and Tables for Heating and Ventilating Work for Those Who Plan or Erect Heating Apparatus. By J. H. Kinealy. New York: David Williams Company. 1899. Pp. 53.

This work will prove of value to all who have occasion to arrange heating and ventilating plants. Good work has recently been done in Germany, and we ought to receive the benefit of it.

THE DIURNAL THEORY OF THE EARTH. Or, Nature's System of Constructing a Stratified Physical World. By William Andrews. New York: Myra Andrews and Ernest G. Stevens. 1899. Pp. 551.

THE ART OF THINKING. By T. Sharper Knowlson. London and New York: Frederick Warne & Company. 1899. Pp. 139. Price $1.

A valuable little book which makes us see how defective we sometimes are in the art of thinking. It is an excellent book for every one to read, and all will be sure to be benefited by it.

ESSAYS ON THE FOUNDATION OF EDUCATION. By Rev. J. Godrycz, Ph.D. Lansing, Mich. 1900. 12mo. Pp. 168.

The author deals with "Intellectual Education," "Methods of Teaching History," "Religious Education," "International and Civil Law," "Moral Education," "Physical Education," etc.

CATALOGUE OF THE ANNUAL ARCHITECTURAL EXHIBITION, 1899–1900. Philadelphia: T Square Club. 1899. Small quarto. Pp. 210. Price 50 cents.

This handsome volume is filled with excellent architectural designs, both projected and actually executed. It shows what remarkable architectural work is being done in the United States.

SEEGER AND GUERNSEY'S CYCLOPEDIA OF THE MANUFACTURES AND PRODUCTS OF THE UNITED STATES. New York: The United States Industrial Publishing Company. 1899. 8vo. Pp. 1356. Price $10.

That the earlier edition has been in constant use in our office for some years in answering manifold queries as to manufacturers of all kinds of goods is a sufficient guarantee of the great excellence of the work. Its value has been demonstrated almost daily particularly in the consideration of cases where manufactured goods are made in small quantities or are of odd, out of the way articles. The arrangement is admirable, and access is rendered easy by means of a fine analytical index.

Business and Personal.

Marine Iron Works. Chicago. Catalogue free.

"U. S." Metal Polish. Indianapolis. Samples free.

Yankee Notions. Waterbury Button Co., Waterb'y, Ct.

For bridge erecting engines. J. S. Mundy, Newark, N. J.

Handle & Spoke Mchy. Ober Mfg. Co., 10 Bell St., Chagrin Falls, O.

Ferracute Machine Co., Bridgeton. N. J., U. S. A. Full line of Presses, Dies, and other Sheet Metal Machinery.

Inventions developed and perfected. Designing and machine work. Garvin Machine Co., 141 Varick St., N. Y.

The celebrated "Hornsby-Akroyd" Patent Safety Oil Engine is built by the De La Vergne Refrigerating Machine Company. Foot of East 138th Street, New York.

The best book for electricians and beginners in electricity is "Experimental Science," by Geo. M. Hopkins. By mail, $4. Munn & Co., publishers, 361 Broadway, N. Y.

☞ Send for new and complete catalogue of Scientific and other Books for sale by Munn & Co., 361 Broadway, New York. Free on application.

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 remunerations.

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.

(7828) F. A. writes: I have read of a machine so constructed as to show the motion of the earth. It consists of a pendulum supported on a framework. How heavy would the pendulum have to be, and how long the rod to pendulum to construct a small model that would work with satisfaction? Could one be made with a pendulum weighing say three or four pounds and the rod about two feet long? A. The experiment is called Foucault's experiment from its inventor. The pendulum should be as long as possible, though with one 16 to 20 feet long you would probably succeed. The ball should be as heavy as convenient, ten to twelve pounds. A strong steel wire should be used to support the weight. The support at the top should be as rigid as possible. The space within a stairway several stories high is well adapted to the experiment. One was hung in Bunker Hill Monument, 222 feet high. The ball is made to swing exactly north and south, at the start. In even five minutes its deviation may be noticed, the south end of the swing falling to the west of the meridian. In this latitude the deviation is about 9 degrees in an hour. A valuable article on this topic is found in the SCIENTIFIC AMERICAN SUPPLEMENT, No. 627, price 10 cents.

(7829) G. B. asks: What becomes of the latent and active heat contained in air or water when the oxygen therein combines with other substances, as in malting, fermenting, spontaneous combustion, putrefactive fermentation, in all which a rise of temperature takes place? Is not the latent heat the source of supply? And also animal heat, is it supplied by the same cause, that is, the latent heat supplied in oxidizing the blood? I am led to this way of thinking by the effect produced on air by depriving it of its latent heat; it becomes "liquid air." A. The heat given off when the various changes described above take place is due to the chemical combinations which occur. There is no liquefaction of the oxygen in any of these cases, but there is chemical action. This is a source of heat. The latent heat of air or water is given off when they change their state to the liquid or solid form.

(7830) W. F. asks: What magnifying power (number diameters) a microscope should possess to reveal spermatozoa and the consumption germ? A. For observing such objects, an objective of at least one-fifth inch focal length is required, and an eighth should be had if possible. The eighth inch with a 2-inch eyepiece gives a magnifying power of 425 diameters; with an inch eyepiece, 780 diameters; and with a half-inch eyepiece, 1,200 diameters. This is enough for any purpose.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Issued for the Week Ending

FEBRUARY 13, 1900.

AND EACH BEARING THAT DATE.

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

Acetone, preparing haloid derivatives of, L. Lederer ... 643,144
Acetylene generator, R. L. Beck ... 643,243
Acid, nitroamidoanthraquinone sulfo, O. Bally ... 643,451
Acids, purifying sludge, Waring & Brecke ridge ... 643,578
Addressing machine, envelop or wrapper, C. A. Belknap ... 643,394
Advertising coach, M. A. Michales ... 643,517
Air brake, C. L. V. Mundhenk ... 643,421
Air compressor, W. D. Hooker ... 643,135
Air purifying and drying apparatus, Birdsall & Krum ... 643,396
Alarm. See Burglar alarm. Fire alarm.
Automatic lubricator, R. S. O'Brien ... 643,303
Automobile fender, C. E. Belcher ... 643,370
Automobile vehicle gearing, L. H. Dyer ... 643,595
Back pedaling brake, H. S. Baker ... 643,450
Back pedaling brake, F. P. Hinckley ... 643,600
Bag. See Sample or conveying bag.
Bait, artificial, Votaw & Thomas ... 643,573
Banana shipping case, F. Schmitz ... 643,163
Banjo tailpiece, G. A. Rapp ... 643,159
Barrel locking mechanism, F. A. Hollenbeck ... 643,601
Basket stapling machine, J. C. Titus ... 643,568
Bearing, roller, H. B. Gillette ... 643,122
Bearings, cutting machine for making ball, K. Keyssner ... 643,381
Bed bottom, R. Schmidt ... 643,208
Bed, sofa, A. D. Tomlinson ... 643,210
Bedstead, B. R. Blaisdell ... 643,589
Belt fastener, A. L. Eaton ... 643,348
Bicycle brake, P. J. Parmiter ... 643,231
Bicycle crank shaft, W. H. Fauber ... 643,349
Bicycle support, J. Schirra ... 643,610
Bicycle support, E. J. Tierney ... 643,566
Bicycles, parcel rest and seat annex for, Gabriel & Atkinson ... 643,373
Binder, temporary, Kendig & Coleman ... 643,380
Blind slat adjuster, J. R. Morgan ... 643,361
Blind slat retainer, E. A. Thrall ... 643,565
Boat driving gear, J. A. Freund ... 643,490
Boiler. See Washboiler.
Boiler, E. J. Sabin ... 643,207
Bolster, W. F. Voss ... 643,572
Bookbinding, gummed cloth for, C. H. Crowell ... 643,594
Book rest, E. H. B. Hughes ... 643,188
Boring apparatus, deep, J. Vogt ... 643,428
Boring instrument, J. J. Tynan ... 643,260
Bottles, antirefilling device for, C. H. Whitaker ... 643,216
Box. See Match box. Paper box. Steam box.
Box fastener, A. Jarolimek ... 643,296
Box machine, G. Taggart ... 643,279
Box making clamp, W. L. Smith ... 643,551
Brake. See Air brake. Back pedaling brake. Bicycle brake. Car brake. Wagon brake.
Bridge gate, P. Gfroerer ... 643,407
Brush, H. Zias ... 643,441
Brush, fountain mucilage or paste, J. F. Walker ... 643,174
Buffing machines, apparatus for making abrasive covers for, Rogers & Winslow ... 643,235, 643,236
Buggy tops, mechanism for raising or lowering, C. R. Hesseltine ... 643,132
Bunsen burner for liquid hydrocarbons, R. Adam ... 643,097
Burglar alarm, J. T. Friend ... 643,405
Burner. See Bunsen burner. Gas burner. Hydrocarbon burner.
Burner, N. H. Bledsoe ... 643,105
Burning refuse, receptacle for, A. W. Cox ... 643,593
Button, A. Hall ... 643,409
Button, C. S. E. Spoerl ... 643,242
Button machine, N. Barry, Jr. ... 643,585
Button making machine, N. Barry, Jr. ... 643,586, 643,587
Button, separable collar, W. H. H. Wertz, Jr. ... 643,579
Can cover, garbage, M. Fischer ... 643,489
Can washing machine, J. Des Brisay ... 643,479
Cane carrier, sugar, J. E. Tallet ... 643,558
Car brake, railway, G. S. Fanning ... 643,487
Car coupling, G. Arend ... 643,282
Car coupling, A. S. Martin ... 643,145
Car coupling, C. A. Tower ... 643,613
Car coupling, J. Willison ... 643,580, 643,581
Car coupling, G. Yates ... 643,182
Car coupling, automatic, E. Best ... 643,104
Car coupling for mines, H. Hughes ... 643,504
Car curtain, vestibule, T. H. Wickes ... 643,217
Car draft rigging, W. Case ... 643,590
Car fender, Porter & Barnes ... 643,199
Car side guard, C. J. Reilly ... 643,201
Car step, extension, B. E. Pines ... 643,155
Car wheel, noiseless, I. Hogeland ... 643,134
Carbureter, S. Broichgans ... 643,397
Carbureter, V. J. A. Rey ... 643,306
Carbureter, W. S. C. Russell ... 643,206
Carriage, motor, E. A. Sperry ... 643,257
Carriages, adjustable spring for baby, G. A. Smith ... 643,365
Carrier. See Cane carrier.
Cartridge belt, E. T. Gibson ... 643,495
Case. See Banana shipping case. Display and sample case.
Cask or barrel supporting apparatus, C. Lampitt et al ... 643,298
Casks or barrels, apparatus for pitching internal surfaces of, C. A. Neubecker ... 643,523
Caster, A. B. Diss ... 643,481 to 643,483
Caster socket, G. D. Clark ... 643,468
Chair. See Rocking chair. Swinging chair.
Clamp. See Boxing clamp. Shaft clamp.
Clasp. See Strap connecting clasp.
Clay, porcelain, etc., machine for molding in, J. H. B. von Konigslow ... 643,417
Cleaner. See Dish cleaner.
Clevis, plow, W. G. Landers ... 643,510
Clock, electric, H. Iversen ... 643,506
Clothesline support, W. B. Robinson ... 643,160
Clothes pin, C. L. Prime ... 643,533
Clothes pin springs, machine for making wire, J. Drummond ... 643,224
Coffee pot, G. W. White ... 643,433
Controller, T. von Zweigbergk ... 643,442
Copying paper, moistening, F. G. J. Post ... 643,234
Corn popper, F. J. Becker ... 643,103
Corn sheller, W. C. Rowe ... 643,161
Cot, folding, S. T. Hutchinson ... 643,137
Cotton beater locking device, C. E. Smith ... 643,277
Cotton opening machines, lap roll tension for, F. H. L. James ... 643,295
Cotton press, H. M. Parker ... 643,152
Coupling. See Car coupling. Hose coupling. Thill coupling.
Cradle, swinging, J. F. Grimmett ... 643,267
Crate, folding, Taylor & Moore ... 643,562
Cream separator, W. J. Gould ... 643,351
Creamer, centrifugal, O. Anderson ... 643,218
Current meter, alternating, G. A. Scheeffer ... 643,162
Curtain pole, window, J. Lacy ... 643,142
Cushion fall stretcher, J. E. La Dow ... 643,297
Cut off and filter, automatic, M. M. Hitt ... 643,355
Cutter. See Fruit or vegetable cutter. Meat cutter. Paper cutter. Stalk cutter.
Dam, retaining wall, breakwater, etc., J. S. Fielding ... 643,488
Davit, ship's, J. W. McKinnon ... 643,197
Dental tool, for expressing mercury from amalgam, D. Aiken ... 643,443
Derrick, portable, J. B. Lord ... 643,360
Desk for hanging over the shoulders, reading or writing, H. Schnell ... 643,164
Digger. See Earth digger. Potato digger.
Dish cleaner, J. F. Parish ... 643,424
Disinfecting telephones, etc., device for, W. H. Taylor ... 643,309
Display and sample case, Underwood & Hawkins ... 643,570
Display holder, hat, S. E. Griggs ... 643,266
Door catch, M. J. Thuestad ... 643,612
Door frame and adjustable jamb therefore, S. S. Colt ... 643,399
Door lock, sliding, J. A. Eastman ... 643,245
Door, sliding, E. & A. Schmitt ... 643,307
Draft equalizer, two horse, G. L. Eason ... 643,404
Draw bar supporting mechanism, J. A. Yerk ... 643,315
Draw knife, I. S. Bailey ... 643,314
Drier, J. McCusker ... 643,149
Driers, apparatus for discharging water and air from cylinder, A. G. Paul ... 643,198
Drill. See Grain drill.
Driving mechanism, W. J. Thompson ... 643,564
Dye, from gallocyannin, blue, A. Steiner ... 643,338
Dye, red rhodamin, J. J. Brack ... 643,371
Dye, yellow acridinium, F. Ullmann ... 643,569
Earth digger and scraper, combined, B. F. Shuart ... 643,240
Electric distribution systems, safety device for, E. M. Hewlett ... 643,133
Electric energy, means for controlling and indicating the supply of, C. R. Loubery ... 643,228
Electric flashing switch, A. L. Cotter ... 643,401
Electric furnace, A. J. Peterssson ... 643,254
Electric meter, Barker & Ewing ... 643,392
Electric traction motor, Richter & Eschler ... 643,276
Electric traction, surface contact stud for, W. Kingsland ... 643,414
Elevator, J. Fletcher ... 643,596
Elevator gate operated lock, J. Fletcher ... 643,598
Elevator safety device, J. Fletcher ... 643,597
Elevators, automatic safety device for, G. A. Newell ... 643,270
Engine. See Fluid pressure engine. Rotary engine.
Engine igniter, explosive, F. J. Macey ... 643,513
Envelope, E. E. Myers ... 643,333
Envelopes against surreptitious opening, method of and means for protecting, W. P. Horton Jr ... 643,376
Extension handle for culinary articles, P. Fromholz ... 643,292
Faucet for liquefied gas, measuring, W. F. Fritz ... 643,406
Feed stop mechanism, H. E. Harbaugh ... 643,599
Feeder, calf, I. H. Hall, Jr. ... 643,287
Fence, L. S. Morgan ... 643,332
Fence, picket, L. Trabue ... 643,310
Fences, machine for weaving cross wires in, T. F. Carpenter ... 643,109
Fender. See Automobile fender. Car fender.
Filter, F. G. Kammerer ... 643,411
Filter, G. W. Woodworth ... 643,181
Filter strainer, O. H. Jewell ... 643,138
Filter, submerged, D. J. Bliss ... 643,463
Filter, water, D. J. Bliss ... 643,462
Filtering material, washing apparatus for, F. Sochurek, Sr. ... 643,337
Fire alarm, pyroxylin automatic electric, J. de Froment ... 643,491
Fire escape, Walker & Horner ... 643,575
Fire escape device, E. P. Felker ... 643,286
Fire extinguisher, M. E. Ogden ... 643,252
Fishing rod reel, T. Ross ... 643,538
Flail, S. R. Divine ... 643,186
Fluid pressure engine, A. H. Crockford ... 643,474
Fly exit for screens, H. N. Sheek ... 643,335
Fodder binder, J. T. Atkin ... 643,391
Folding table, D. W. Lloyd ... 643,511
Foods, coating, Lanwer & Ruping ... 643,359
Form, garment, E. M. Schrader ... 643,543
Framing joint, E. E. Squires ... 643,552
Fruit butter, apparatus for making, F. Moss ... 643,362
Fruit or vegetable cutter, J. Blonde ... 643,106
Furnace. See Electric furnace. Heating furnace. Smoke consuming and fuel economizing furnace.
Furnace for baking enamels, glassware, and porcelain, A. J. A. Berthelier ... 643,458
Furnace grate, zinc, J. D. James ... 643,507
Furnaces, revoluble grate for bagasse, Payne & Joubert ... 643,153
Furniture, B. R. Blaisdell ... 643,588
Game or puzzle, J. C. Teller ... 643,170
Game of dominoes, machine for keeping count of, J. W. Marler ... 643,515
Garment supporter, Bigger & Leonard ... 643,317
Garment tab, S. A. Saeger ... 643,238
Gas burner, F. J. Byrne ... 643,320
Gas burner cut-off, automatic, F. H. Oehlke ... 643,363
Gas burner, oil, G. T. Phelps ... 643,304
Gas burner, superheating, J. L. Campbell ... 643,466
Gas burning apparatus, S. W. Stott ... 643,259
Gas generating apparatus, acetylene, F. L. Rand ... 643,158
Gas generator, acetylene, H. J. Ennis ... 643,486
Gas generator, acetylene, G. F. Simpson ... 643,256
Gas generator, acetylene, Stewart & Updegraff ... 643,555
Gas machine, acetylene, J. Walton ... 643,576
Gas works valve, T. R. Beal ... 643,393
Gasometer, J. Walton ... 643,577
Gate. See Bridge gate.
Gate, U. A. Gregg ... 643,325
Gate, D. Miller ... 643,147
Gate, R. Rakestraw ... 643,157
Gate, J. P. Tarr ... 643,559
Gate, B. F. Warner ... 643,175
Gearing, electromagnetic variable speed and clutch, R. Kennedy ... 643,413
Generator. See Acetylene generator. Gas generator. Steam generator.
Glass plates, making concavo convex, Dbe & Houze ... 643,223
Glassware manufacturing machine, F. O'Neill ... 643,253
Gold washing machine, F. C. Pinnell ... 643,233
Grading machine, road, E. C. Fread ... 643,115
Grain drill, Ames & Labare ... 643,446
Grain drill gear, Ames & Labare ... 643,447
Grain drill shoe, detachable, D. J. Ames ... 643,445
Grain drill shoe, detachable, Howe & Labare ... 643,410
Grain drill shoe, detachable, N. M. Wig ... 643,435
Grinding mill, Kelley & Rouse ... 643,412
Grindstones, emery wheels, etc., roller for round picking, C. A. V. Hallgren ... 643,128
Gun, automatic machine, F. M. Garland ... 643,118
Gun mechanism, automatic machine, F. M. Garland ... 643,119
Halter, H. L. & C. M. Green ... 643,123
Hammer, drop, F. F. Bischoff ... 643,461
Hammock fan mechanism, E. B. & C. W. Brown ... 643,107
Handle. See Extension handle.
Harrow, tooth fastening, J. J. Callender ... 643,465
Harvester, J. J. Kennedy ... 643,227
Hay rack, E. Troy ... 643,211
Headlight, J. Kirby, Jr. ... 643,141
Heater. See Hot water heater. Water heater.
Heating furnace, A. Laughlin ... 643,143
Heating plant, steam, J. D. Robertson ... 643,535
Hoisting machine, S. Mattson ... 643,516
Hoof protector, H. Gale ... 643,246
Hook. See Miner's bucket locking hook.
Horseshoe, cushion, H. Paar ... 643,272
Hose coupling, M. J. Konold ... 643,358
Hot water heater, W. K. Hopler ... 643,503
Hub, J. A. Cripe ... 643,185
Hydrocarbon burner, J. Johnston ... 643,602
Ice machine, plate, J. C. Kitton ... 643,269
Incubators, thermostatic governor for, M. M. Johnson ... 643,508
Indigo leuco compounds, manufacturing, A. H. S. Holt ... 643,502
Influence machine, H. E. Waite ... 643,367
Irrigation of arid land, L. L. Smith ... 643,550
Jars, bottles, etc., closure for, A. L. Weissenthanner ... 643,215
Joint. See Framing joint. Tube joint.
Knife. See Draw knife.
Lamp, acetylene, W. P. Crary ... 643,111
Lamp, acetylene gas, W. A. Barrows ... 643,101
Lamp, acetylene gas generating street, W. C. Clarke ... 643,222
Lamp burner, H. Greenwood ... 643,496
Lamp, fumigating, R. S. West ... 643,312
Lamp, incandescent, Rulon & Keen, Jr. ... 643,425
Lamp, miner's, W. A. Dunlap ... 643,112
Lamp, pit or mining, R. C. West ... 643,281
Lamp shade, E. T. Berggren ... 643,395
Lamps, refracting attachment for bicycle, A. W. Hecht ... 643,129
Lathe apron, engine, W. E. Moffatt ... 643,194
Lathe bed and apron, W. Lodge ... 643,190
Lathe, crank pin or eccentric turning, Tindel & Albrecht ... 643,172
Lathes, speed changing gear for engine, W. Lodge ... 643,191
Leaf gatherer, R. Smith ... 643,386
Leather loop pressing machine, S. B. Beasecker ... 643,316
Linotype machine, D. A. Hensley ... 643,289
Linotype machine, Holliwell & Elliott ... 643,292
Linotype machine, J. MacKirdy ... 643,329
Linotype machine casting mechanism, J. Place ... 643,274
Liquid meter, Washington & Goodwin ... 643,432
Lock. See Door lock.
Locomotive, J. B. Tate ... 643,560
Loom, J. H. Northrop ... 643,271
Loom, H. Wyman ... 643,389
Loom harness, W. S. Lackey ... 643,509
Loom take up mechanism, A. W. Clement ... 643,287
Loom warp stop motion, R. Crompton ... 643,402
Loom warp stop motion, C. A. Littlefield ... 643,299, 643,300
Lubricator. See Automatic lubricator.
Mail bag gripping and delivering device, S. R. Patten ... 643,529
Mains, street box for underground, C. H. Campbell ... 643,106
Mangle, A. Kreuter ... 643,189
Match box, A. Fearnaught ... 643,350
Match machine, C. W. Steele ... 643,554
Match making machine, F. M. Clough ... 643,470
Match receptacle, I. H. Taylor ... 643,561
Match splint making machine, W. H. H. Sisum ... 643,546
Measuring and comparing illumination, apparatus for, J. Bijur ... 643,184
Measuring device, A. Janney ... 643,377
Meat cutter, E. F. Smith ... 643,547, 643,549
Meat foods, making, I. A. Timmis ... 643,567
Mechanical movement, A. J. Robinson ... 643,536
Metal bending machine, Henius & Herrold, ... 643,353, 643,354
Metal hardening apparatus, C. W. Sponsel ... 643,278
Metal, table for hooping coiled, W. A. Cowles ... 643,472
Meter. See Current meter. Electric meter. Liquid meter.
Microphonic transmitter, G. F. Dupont ... 643,484
Mill. See Grinding mill. Tube or pebble mill. Windmill.
Mill, J. A. Peer ... 643,273
Miner's bucket locking hook, E. J. Richmond ... 643,534
Mining machine, C. Robinson ... 643,537
Motor. See Electric traction motor. Vehicle motor. Wave motor.
Motor operating plant, M. W. Quick ... 643,156
Mowers, adjustable ball bearing for lawn, J. Braun ... 643,318
Music holder, P. Bennan ... 643,456
Musical instrument, stringed, A. E. Bark ... 643,452
Musical instrument, stringed, A. Gunkel ... 643,125
Nail puller, W. L. Lubbock ... 643,512
Napping machine, D. Gessner ... 643,247, 643,248
Needle, self threading, Bunnell & Nichols ... 643,398
Nut lock, S. Harrell ... 643,500
Nut lock, J. A. Nickerson ... 643,615
Nut lock, D. Rhodes ... 643,364
Nut lock washer, E. L. Edmonson ... 643,485
Oven, baking, C. Rinck ... 643,202
Packing, R. C. White et al ... 643,341
Paddle wheel, J. S. Allison ... 643,444
Padlock, permutation, A. Amess ... 643,448
Paper box, F. T. Miyaji ... 643,420
Paper box, F. A. Stecher ... 643,356
Paper coating machine, W. H. Waldron ... 643,574
Paper cutter, J. E. Hill ... 643,374
Paper holder, roll, J. E. Hill ... 643,375
Paper manufacture, screen plate for, W. H. McCarroll ... 643,521
Paper or pulp vehicle tops, apparatus for making, T. W. McFarland ... 643,422
Phonograph, G. Bettini ... 643,183
Phonograph, T. B. Lambert ... 643,418, 643,419
Photographic dark room, portable, L. C. Cox ... 643,322
Phthalein in phenol, solution of, C. E. Gassmann ... 643,265
Picture, A. N. Polymath ... 643,275
Pin. See Clothes pin. Safety pin.
Pipe. See Tobacco pipe.
Pipe joints, clamp for repairing leaks in, C. M. Rankert ... 643,200
Planer, hand, F. Witzmann ... 643,313
Planing machine, E. Holmes et al ... 643,293
Planter, hand, C. Newman ... 643,524
Plate lifting device, F. S. Snyder ... 643,168

(Continued on page 126)