RECENTLY PATENTED INVENTIONS. Electrical Devices.

ELECTRICALLY - OPERATED GUN CON-TROL .-- J. B. RYAN, Hoboken, N. J. This invention relates to gunnery, the more particular object being to provide means for readily enabling a heavy gun to be maintained as nearly adhesive material from flowing, or which may as practicable in proper position to fire at a target, notwithstanding motions of a vessel upon which the piece may be mounted.

Of Interest to Farmers.

BERRY-HOLDER.-W. A. DAY, Bellingham, Wash. In operation the third and fourth fingers of the wearer are inserted in the loop formed which there is provided an overhanging flange by a strap and a strap buckled around the wrist of the same hand. Each hand may be if desired supplied with a holder, and as the berries are picked from the briars by the thumb the handle, so that the vessel may be inverted and first two fingers, they are dropped into the holder, which when full is emptied into a larger receptacle.

Of General Interest.

PROCESS OF MANUFACTURING STEEL. -W. R. WALKER, Chicago, Ill. This is a process whereby a spiegel having especially its manganese and as well its carbon and silicon contents more thoroughly and uniformly distributed therethrough can be obtained without device and the power transmission therefor; the necessity of melting the spiegel within a cupola. It enables spiegel to be suitable as a recarburizing addition to the charge of a Bessemer converter or like refining chamber, to be produced from low grade ores.

BEEF-TRUCK CRADLE .-- C. A. PARKERSON, for supporting the dressed meat or other bodies from the overhead tracks, and the invention relates more particularly to a cradle for engaging with the roller of the truck for raising the latter and depositing the same upon the overhead track.

SUBSTITUTE FOR PATENT-LEATHER.-S. NATHAN, New York, N. Y. The improvement is in material adapted to be used as a substitute for patent leather and the process by which the material may be manufactured. It is adapted for use for all purposes for which patent leather is normally employed, but is more particularly adapted for use in the manufacture of ladies' belts and similar articles requiring strength and durability.

APPARATUS FOR DETERMINING SPE-CIFIC GRAVITY.—F. A. COURTOIS, New York, N. Y. An object of the inventor is to provide an apparatus for determining specific gravities, particularly of liquids, which obviates the difficulties encountered in obtaining the hydrometer readings owing to the presence of the meniscus of the liquid under investigation.

BRUSH FOR WASHING BOTTLES.-C. K. VOLCKENING, New York, N. Y. In operation, the wipers are brought together and the ferrule carrying them is inserted in the bottle. spindle being turned, studs and ribs are brought into contact with the interior of the bottle, cleaning it thoroughly, the water being forced into the bottle through the educts. The brush withdrawn, the conformity of the bottle neck forces the wipers toward each other, thereby pressing the spring slightly. The brush com pletely removed, this spring and the wipers regain normal positions.

BREECH-PROTECTOR .- E. L. HANN, Dec'd, Denton, Texas. The objects of the invention are to provide means for protecting the exposed breech ends and other adjacent parts, and for protecting the hands of the person cleaning or handling the same. It comprises a protecting cover, and means for removably

PHOTOGRAPHIC SHUTTER.-H. A. BYERS. Pe Ell, Wash. The invention improves on a relative exposure of the plate, so that the sky portion and foreground will be exposed to

cream and the cabinet, without danger of the packing entering the receptacle.

FLY-PAPER HOLDER.--J. O. FORKER, New York, N. Y. The special purpose here is to provide a base which may be used alone, for holding a sheet of paper and preventing the be used in conjunction with a cage of coarsely woven wire, which latter protects the paper from above. The cage is so constructed that when detached from the base it may fiatten out to occupy the minimum space.

COOKING UTENSIL.-F. R. MAZZA and C. M. DALY, New York, N. Y. The invention relates more particularly to that type of vessel in or projection beneath which the handle may be inserted for lifting the vessel. The object is to provide means adapted to co-operate with without its becoming separated or detached from the handle.

Machines and Mechanical Devices,

STUMP-SAWING MACHINE.-E. B. WEB STER, La Crescent, Minn. The objects of the improvements are to provide facilities for positioning the saw with respect to the object on which it is directed; to provide means for expediting the erection and removal of the and to insure durability of the working parts and the entire structure in proportion to the weight thereof.

FRICTION - CLUTCH FOR HOISTING-DRUMS.—F. N. WHITCOMB, Barre, Vt. In this case the invention relates to certain improve-JR., New York, N. Y. Means are provided for ments in hoisting drums, and particularly to handling the trucks or travelers used in the means of operating the clutch thereof. The slaughter-houses, packing houses, and the like, invention involves the structural details of this operating member and the means for controlling the same

> TRIGGER MECHANISM .- E. F. HEDRICK, Fort Bayard, New Mex. This patent discloses a mechanism in connection with the sears and trigger whereby provision is made for locking the trigger as may be desired for using the trigger mechanism in plain trigger position or so as to arrange the mechanism for set trigger position. The devices include safety means for effectually locking the parts in their adjusted positions.

Railways and Their Accessories.

AIR, STEAM, AND SIGNAL COUPLING .-E. B. WITTE, Trenton, N. J. The invention relates to improvements in couplers for use in connection with air brake systems, train signals, and steam heating systems, and involves means whereby when a car is detached from the train, the valves of the car will close to retain sufficient air in the cylinder and pipe line of the car to hold the brakes in release

CAR-STAKE.—A. B. LITTLE, Atlanta, The invention contemplates a stake preferably constructed throughout of malleable iron and forming a permanent part of the car, which may be readily changed from a rigid upright position to a removed depressed position or vice versa as desired, thus effectively retaining the load and permitting its discharge without undue inconvenience.

CLARK, Eastbank, West Va. The purpose of few metals sold as babbitt are made up accord-the invention is to provide a construction for ing to the original formula, which consisted a cattle guard, that will effectively prevent the crossing of a railroad track by cattle or other animals that avoid traverse of insecure supporting surfaces.

Pertaining to Recreation.

JUMPING-ROPE HANDLE.-C. H. SAPPER, attaching it to the breech of the barrel or Highlands, N. J. In this instance the in-frame of a gun. vention relates to jumping rope handles, and has for its object the provision of the handles acts this shrinkage, and an alloy of eight parts of a jumping rope with music boxes, so conpatent formerly granted to Mr. Byers, to the structed as to be operated by the user when extent that the means used for varying the the rope is in use. A further object is to provide reversible means for operating the boxes. ing. Lead and antimony combine well in any actinic action of rays of light different lengths Mass. The invention relates to guidable properties of either; an alloy of 80 parts lead speed regulation, with reference to reduced or interest by Mr. Plimpton in the U. S. and Engbe quickly and conveniently made, it being also the stock or foot-stand of the skate so that metals, and there is nothing better as an anti-

all suspension springs whatever be their strength.

SPINDLE - UPSETTING DEVICE.—S. L. BLAKE, Paducah, Ky. The purpose of the invention is to provide a construction for a device adapted to stave up or upset a vehicle axle spindle, by longitudinally applied compression, whereby a worn spindle may be restored to its original diameter and close fit within a box in a wheel hub when it is rotatably secured upon the spindle.

PORTABLE FARE AND TICKET RECEP-TACLE .- E. J. VARGYAS, New York, N. Y. The place were known, a compound exactly like that receptacle or box is mainly designed for the, could be made in the laboratory. There are no use of conductors of street cars and other ve-junknown substances in the air unless in most hicles, and is arranged to provide compartments minute quantities, so minute that they have not for the reception of the fare received to allow of conveniently making change, to register the number of fares received, and to provide for the issuance of trip or transfer tickets.

ELASTIC-TIRE WHEEL .- A. D. FOUCART, Muncy, Pa. The invention is an improvement in means for securing pneumatic and taining power of the air is much less at two solid rubber tires to the rims of wheels, particularly such as are intended for use on automobiles, bicycles, and traction engines. The means employed enable the tire to be readily applied or detached and yet hold the same securely.

the invention, and date of this paper.



the head of this column in the issue of Novem- ficient to cause them to leave the original mass, ber 14 or will be sent by mail on request.

are building a two-revolution printing press, one that has a printing capacity of 2,000 per hour. We are thinking of babbitting the main driving-shaft bearing. Will you write us a let-ter advising as to the durability of babbitt bearings? A. Without any especial knowledge of the mechanics of printing presses, we cannot see any objection to the use of babbitt for the purpose you mention. The practice of lining journal boxes with a metal that is sufficiently fusible to be melted in a common ladle is not always so much for the purpose of securing about five hours, so rapidly that the moon was anti-friction properties as for the convenience and cheapness of forming a perfect bearing in line with the shaft without the necessity of boring. Boxes that are bored, no matter how position and permit the car to move by its accurately, require great care in fitting and own momentum to the desired point. a machine. In this respect it is a good and to this hypothesis, and the solar attraction economical practice to use babbitted boxes, but caused it to move away from the earth while the shaft should not be used for the purpose of casting the bearings, as the hot metal is apt to spring it, and a mandrel of the same size as the shaft or very slightly larger should be used. Care should be used in the selection of the babbitt, according as the bearing is to adue inconvenience. CATTLE-GUARD.—A. M. HOWERY and J. B. speed shafting, or any other combination. Very ing to the original formula, which consisted principally of tin and some copper and antimony, and many are simply refuse from type foundries and similar sources cast into fancy ingots and given an attractive name with no reference to their wearing qualities. For wearing properties, with a moderate speed, nothing is better than pure zinc, of which the only disadvantage is that its shrinkage in cooling inclines it to leave the box, so that it is generally mixed with another metal. Tin counterzinc and two parts block tin has excellent wearing qualities for speeds not over 400 R. P. M. and withstands very heavy loads without crush-ROLLER-SKATE.-J. L. PLIMPTON, Boston, proportions without reducing the anti-friction to 20 parts antimony runs freely in the melted state has practically no shrinkage on cooling. prolonged exposure of sky or foreground, can land. In this class the rollers are applied to is much harder when cold than most bearing possible to effect a passage of the shutter the said rollers may be cramped or turned, so friction metal for high-speed boxes. Care should possible to effect a passage of the shutter the said rollers may be cramped or turned, so including the ingrespect boars, cart should never be placed in horizontal sockets. We have our active lines, be used in pouring it, and it should never be placed in horizontal sockets. We have our obtain ranid instantaneous exposure. Reliable makers of bearing metals will quote excepting the vertical position. you material especially suited to the speed and weight of your shaft. the letter of G. L. P., No. 10994, and your then in what month of the year? If it cannot reply with a good deal of interest. If G. L. P. be seen here, then what is the farthest north will figure out the areas of the triangles and it can be seen? Is there another constellation polygons that he has himself marked out, he will see that the areas of the two triangles A B E and E B F are 12 square inches each, making 24 square inches, and the areas of the polygons E G H C and G F D H are 20 square inches each, making 40 square inches, or a total of 64 square inches, which is just the same as the 8x8 inch square was to begin

JANUARY 2, 1909.

, to all kinds of vehicles and can be regulated for | only in his case, instead of making the audience believe he has been cutting off a man's head, he makes them think, by his bad drawing, that he has gained one square inch in the process of cutting up.

(11068) C. C. S. asks: 1. Is it known what the air 20 miles from the earth is composed of? A. It is not known with certainty what the constituents of the air are at 20 miles above the earth's surface. No balloon has attained that altitude to collect air. 2. Is it possible to make the same on the face of the earth? A. If the composition of the air at any been detected by the most delicate analysis up to the present time. 3. Would it take more or less power to sustain the same given weight at a height of two miles from the earth's surface than it would to sustain the same weight at a height of but twenty feet? A. The susmiles above the earth than at sea level. At three miles above sea level the sustaining power of the air is only half that at sea level. It will therefore require more outside power to sustain a body at two miles above than at the surface of the earth. The sustaining power of the air is proportional to its density. A cubic be furnished by Munn & Co. for ten cents each. Please state the name of the patentee, title of Fahr. weighs 1.225 ounces and can sustain that the investion of the state of th part of the weight of a cubic foot of anything. The rest of the weight of a cubic foot of anything must be sustained by some other power than the air.

(11069) E. L. S. asks: It being conceded by most astronomers that the earth and the other planets are bodies thrown off by centrifugal force from the sun, explain how it was that they took up an orbital motion at any fixed distance from the sun. In other words, Full hints to correspondents were printed at as there was evidently a centrifugal force sufand as the gravitational force exerted upon them by that mass decreased as the square of (11066) The S. P. P. Co. says: We their distance from it, why should they have ever come to rest in a prescribed orbit? What gave them their orbital motion, since a body acting under centrifugal force leaves the source of that force at a tangent and progresses in a straight line? A. The simplest case of tidal evolution is that of the moon and the earth. If that can be satisfactorily explained, the more complicated cases of the planets and the sun may perhaps be accounted for. When the moon separated from the earth, the rotation of the combined masses was supposed to be made in in unstable equilibrium regarding the earth. In this condition it had little or even no weight toward the earth, and the sun pulled the moon off from the earth by a tidal action. The moon was going around the center of gravity of the earth and itself in about five hours according still it revolved around the earth. Its orbit in space then was a spiral, and it moved away from the earth, not in a straight line at all, but in a curve of which the center of the earth was one point or center or revolution. This interesting hypothesis is well stated in Moulton's "Introduction to Astronomy," which we send for \$1.60.

> (11070) W. W. C. asks: 1. What are the granules used in a regular telephone transmitter? I tried carbon, but it worked to little advantage; it had a loose rattling sound. A. The granules used in a telephone transmitter are of carbon graphite. They can be bought of different sizes from dealers in electrical goods. You cannot make them, unless you have some means of shaping them and polishing them after they have been made spherical. It is cheaper to buy the granules. 2. Can a plug gage of a given size be made to go into a cylindrical gage of the same size? If so. how? A. A plug gage can be made to go into a hollow gage by heating the hollow gage, thus expanding it somewhat. If they were of the same size, the plug could not be driven cold into the hollow gage without considerable force. 3. Is it absolutely necessary that a tungsten electric light hang vertical? If so, why? A. Tungsten lamps have thus far been hung vertically downward because the filament has been so flexible and brittle. Lately the makers of the lamp have advertised that they might be

obtain rapid, instantaneous exposure.

Heating and Lighting.

AUTOMATIC LAMP-EXTINGUISHER.-C. OLDER, W. S. GEARHART, and H. E. BILGER, Springfield, Ill. The particular purpose of the invention is to provide an approved construction containing a wick snuffer co-acting in connection with a weight, to extinguish the flame whenever the lamp is thrown over on its side or is inclined beyond certain limits in any direction.

Household Utilities.

ICE-CREAM PACKER.-E. C. A. JOHNSON. Virginia, Minn. The device is readily applied for use in holding a receptacle for ice cream

ing or tilting laterally of the stock or footstand.

Pertaining to Vehicles.

TIRE-PROTECTOR.-H. M. LEESE, Washington, D. C. In the present patent the invention is an improvement in tire protectors having for its object the provision of new tires and tires that have become worn and which can be readily applied to and removed from the tire. The wheel to which the tire is adapted may be of an ordinary construction

SHOCK-ABSORBER FOR VEHICLES.-E. E. LANTZ, Paris, France. Inconveniences like the hard riding of a carriage; the shearing of with. It seems absurd for anyone to say that the suspension springs; the frustration of their changing the positions of several pieces of paper | Southern Cross. It consists of four stars in the in proper position in a cabinet, bucket, or tub useful effect; the necessity for continually ad- will make any one of the pieces grow larger, during the packing of the receptacle with ice and salt, and to so construct the device that the ice and salt received thereby will be conducted to the space between the receptacle for avoided in this shock-absorber. It is adapted course due to the sleight of hand you mention; are of the second magnitude.

(11071) A. G. asks: 1. Can the Southern Cross constellation be seen in this (11067) H. T. C. writes: I have read latitude 24 deg. north? If it can be seen, somewhat similar to the Southern Cross? What is its name, and in what latitude seen? A. Alpha Crucis, the brightest and also the most southerly of the stars of the Southern Cross, attains an altitude of about 4 deg. above the horizon in latitude 24 deg. north. On a clear evening about April 1 it will be on your meridian at midnight. There are many configurations of stars similar to those of the form of a four-sided figure, the sides unequal,

(11072) C. W. asks: Will you please explain why the sun shines on the north side of a house two times a day, early in the morn ing and late in the evening? A. From March 22 to September 22 the sun rises north of the eastern point of the horizon and sets to the north of the western point of the horizon. For a time then during the morning and evening it is north of an east and west line through any house which stands north and It will during that time shine on the south. north side of such a house.

(11073) J. D. asks: A bullet fired from a rifle perpendicularly, at what rate of speed would this bullet return to the point at which it was fired-at a greater, less, or same rate of speed? B says it would return to the rifle at the same rate of speed as it had when it started or was fired. A. The air resists the flight of a bullet very sensibly. If it is fired vertically upward, then it will not rise so high as theory requires, and starting to fall from a lower altitude than it should have attained by theory, it will again fail to gain the velocity with which it began its flight. If there were no resistance of the air to encounter, the bullet would rise to the height given by its initial velocity, and in falling, would regain its initial velocity. B is not right.

(11074) S. F. M. says: I wish to know what is considered the average per cent of loss in producing electric light from the coal pile. That is, what per cent is lost in generating steam, then in the engine, then in the dynamo, and then in the light bulb. A. We would say that the statement is frequently made that an incandescent lamp has an efficiency of one per cent; that is, one per cent of the heat value of the coal is given back in light. The arc lamp is more efficient. The steam engine is usually given as about 15 per cent. The dynamo is about 90 per cent. The loss in wiring, etc., depends upon conditions of the local service. Sloane gives the efficiency of the arc as thirteen times that of gas. You will find much in his "Handy Book of Electricity" of value to you. We will send it for \$3.50.

(11075) P. H. says: 1. The distances between graduations on mercury thermometers are uniform. Does mercury expand uniformly for each degree increase in heat? If not, is the thermometer (mercury) scale accurate? A. The rate of expansion of mercury with the rate of temperature increases as the temperature becomes higher, from which it follows that if a thermometer showing the dilation of mercury simply were made to agree with an air thermometer at 32 deg. and 212 deg. Fah., the mercurial would show lower temperature than the air thermometer between those points and higher temperature beyond them. For instance, according to Regnault, when the air ther-mometer marks 662 deg. Fah., the mercurial marks 683.89 deg. Fah., an error of 21.89 in the latter. Actual mercurial thermometers indicate intervals of temperature proportional to the difference between the expansion of the mercury and that of the glass; the latter corrects to some extent the errors arising from inequalities in the expansion of the mercury, so that for practical purposes the mercurial thermometer sensibly coincides with the air thermometer for all temperatures from a few degrees above the freezing point of mercury (-39 deg. Fah.) to about 500 deg. Fah., the errors in the ordinary atmospheric range of temperature being immeasurably small. 2. Is there any limit to the stellar universe? We say that the light from one star takes 20,000 years to reach us. Are there any stars farther away than this? If so, is there any calculable limit? A. Concerning matters which are immeasurable, there is nothing which may be asserted with more assurance than that there are no calculable limits to the stellar universe. There is every reason to suppose that there are stars the light of which has not yet reached the earth though they may have been incan descent for countless ages; quite as probably if they or our telescopes are of sufficient magnitude for their light to be detected at all, the latter will continue to reach us for ages after the stars are extinct.

THE APPLICATION OF HIGHLY SUPERHEATED

State Railways to be the cheapest and simplest Solution of the method. Battery constant level device, storage, E. W. Smith solution of the problem. Much of the success of that application is due to the care and enthusiasm of Mr. Garbe and the thoroughness of the German engineer is admirably exemplified in the manner in which he presents his experience and deductions in this book.

THE TEXT BOOK OF GENERAL BACTERIOL ogy. By Edwin O. Jordan, Ph.D. Philadelphia: W. B. Saunders Com-pany, 1908. 8vo.; pp. 557. Price, \$3 net.

This book is the outgrowth of lectures given to students in the University of Chicago during the past few years. The subject is one that the writer believes should find a place in every general scientific course. The book is chiefly of professional interest to the medical student, but the subject also bears technical relation to household administration, to agriculture, to sanitation and sanitary engineering, and the various industries and technological pursuits. For the general scientific student and reader bacteriology presents certain aspects that tend to widen the outlook upon a variety of human interests. The reader who wishes to acquire greater familiarity with the subject will find some bibliographical references given as a sort of first aid to the investigator. It is an excellent piece of book making, illustrated with well-executed engravings. It is well printed on good paper.

PRINCIPLES AND PRACTICE OF AGRICULTURAL ANALYSIS. VOI. II. Fertilizers and Insecticides. By Harvey W. Wiley, A.M., Ph.D. Easton, Pa.: The Chemical Publishing Company, 1908. 8vo.; pp. 680. Price, \$4.50.

No one is better qualified to speak with authority than the Chief of the Division of Chemistry of the Department of Agriculture. In this volume an attempt has been made to treat the subject of fertilizers and fertilizing materials in the manner followed in the first volume with soils. The general principle of fertilizer manufacture and application have been presented in so far as they seem to throw light on the rational method of examination and analysis. The standard methods of analysis in use in this and other countries have been presented with sufficient fullness for the guidance of the skilled worker and the information of the student. This is the second edition of the book, and all the matter in the volume has been rewritten and brought down to date. New ventures of moment are those relating to the production of nitric acid for manurial purposes from cyanamid and by direct electric oxidation of nitrogen of air. A chapter on the analysis of insecticides has also been added. While not intended in any way as a library guide, Dr. Wiley hopes that this volume may be even more highly appreciated than in its first form by the student, the investigator, and the teacher.

'HÜTTE'': DES INGENIEURS TASCHENBUCH. Proceedings of the Akademischen Verein Hütte. 3 vols. Berlin: Wil-helm Ernst & Son, 1908.

These pocket books are not limited, as one might imagine from their source, to the technology of iron works or even the use of their products but cover in the first two volumes every possible need of the mechanical engineer, marine engineer, and shipbuilder. The tendency of other recent pocket books has been toward condensation and making them more literally books for the pocket, but the Germans go in the other direction and there are parts of these admirably thorough works which might be taken as text books of the subjects discussed.

INDEX OF INVENTIONS For which Letters Patent of the United States were Issued for the Week Ending December 22, 1908, AND EACH BEARING THAT DATE

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

Acid, manufacturing dialkyl barbituric, O. Wolfes NEW BOOKS, ETC. 5 APPLICATION OF HIGHLY SUPERHEATED STEAM TO LOCOMOTIVES. By Robert Garbe. New York: Norman Henley Publishing Company. 8vo.; pp. 70; fully illustrated with folding plates and tables Price 92 50 New York: Norman Kenley fully illustrated with folding plates and tables Price 92 50 New York: Norman Kenley State State

Boom, swinging, J. R. McGiffert.
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Boots and shoes, attaching buttons to the burpers of, J. Mathison
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Boring, tapping, etc., machine, W. Mur-chey
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Bottle attachment, H. B. Deken
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Bottle corking machine, F. Alexander
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of 600 deg Fah and unward ten years ago	Barrage hystur rotary sluice pontoons mov-	Electric invect destroyer Choney & Regger 007.579	Metallic bung washer, A. J. Shone 907,534
or ooo ucg. Fan, and upward, ten years age	able. E. M. Audovin	Electric machine alternating current com	Milting mashing and A V & P I III-
considered impossible at least on locomotives	Battery attachment, storage, R. J. Fleischer 907.487	mutator dynamo W. Doinikoff 907 578	minking machine, cow, A. V. & K. L. Hin-
seems from the experience of the Prussian	Battery cell, storage, P. Kennedy 907.372	Electric motor, G. W. Richardson 907.176	Mill housing, rolling S. E. Diescher