

Science Notes.

The first-aid packages in South Africa have proved very valuable, and their use is recommended to railway employes, miners, and workers at other unusually perilous crafts.

By treatment with iodine and aniline pigments, H. Kraemer has determined that the alternate layers in a starch-grain are due to a substance rich in colloids but poor in crystalloids, alternating with a substance rich in crystalloids but poor in colloids. — Botanical Gazette.

Some specimens of the blind fish from the Mammoth Cave of Kentucky have recently been placed in the London Zoological Gardens. These fish have never before reached England alive, and it is supposed that only on one previous occasion have living specimens been exhibited in Europe, viz., in 1870. In that year five fishes were placed in a tank in the zoo at Dublin (Ireland), but they did not live very long, succumbing to a fungoid growth on their bodies.

A German syndicate has just made arrangements whereby it secures all the timber on a large strip of land in the mountains in eastern Kentucky. It is estimated that the strip contains about 800,000 of the finest specimens of oak trees. Foreign syndicates are investing heavily in eastern Kentucky, and especially in timber and mining interests. They own large tracts of the finest land, which will quadruple in value when railroads reach that section of the State.

The following abbreviations of metric units have been decided upon by the International Committee of Weights and Measures: Length: Kilometer, km.; meter, m.; decimeter, dm.; centimeter, cm.; millimeter, mm.; micron, μ. Surface: Square kilometer, km.²; hectare, ha.; are, a.; square meter, m.²; square decimeter, dm.²; square centimeter, cm.²; square millimeter, mm.². Volume: Cubic meter, m.³; stere, s.; cubic decimeter, dm.³; cubic centimeter, cm.³; cubic millimeter, mm.³. Capacity: Hectoliter, hl.; decaliter, dal.; liter, l.; deciliter, dl.; centiliter, cl.; milliliter, ml.; microliter, μl. Weight: Tonne, t.; quintal metrique, q.; kilogramme, kg.; gramme, g.; decigramme, dg.; centigramme, cg.; milligramme, mg.; microgramme, γ.

It was at one time believed that the oldest map was that known as the Peutingerian Table, which was supposed to be a product of the third century, says The Architect, but later inquiries show it to be no older than the twelfth century. It is now generally held that a still more ancient specimen of map-making is a mosaic in Madaba, Palestine. It formed a part of a Byzantine church, and was used as an adornment for the floor. Evidently the artist anticipated the pictorial cartographers of modern times, for an attempt has been made to suggest the character of some of the scenery in Palestine. Practically the greater part relates to that country, and the number of names which are given cannot fail to be useful to modern explorers.

Destruction by Dynamite.

It was reported from South Africa that the Boers recently attempted to destroy a railway tunnel by starting from the opposite ends two locomotives, heavily loaded with dynamite; but these locomotives collided at full speed midway in the tunnel, exploding the dynamite, and, of course, completely wrecking the engines; but (according to a later dispatch) the resultant injury to the tunnel itself was relatively small, and could be repaired easily and rapidly. According to another report, the official mining engineer of the Pretoria government, in charge of the Johannesburg gold mines, said that all the mines of the Witwatersrand could be destroyed in two days by the use of dynamite, if such a step should become necessary. The surrender of Johannesburg to the British, however, with the mines intact, disposed of all these reports of contemplated vandalism.

In view of the fact that a proposition to destroy the mines was made and actually discussed, I take occasion not to discuss the ethical aspects of this use of dynamite, as related to the laws of civilized warfare, but rather to point out that "destruction by dynamite" is not so easy as its projectors are accustomed to consider it. This statement, illustrated already by the experience of Anarchists, Fenians, strikers, and inexperienced miners, seems to have received its latest confirmation in the railroad tunnel mentioned above. The fact is, that when the impact of a dynamite explosion is communicated to a large body of air (as was the case in the great Johannesburg explosion five years ago), it may, through that medium, work widespread wreck; but when it is immediately received by solid masonry or rock, its energy is largely expended in the molecular work of local pulverization, being generated too instantaneously, and too simultaneously throughout the mass of the charge, to permit its seeking "lines of least resistance," or following such lines, once found, with the persistence due to a more gradual expansion, such as the slower, progressive explosion of black powder produces.

Thus, in one instance, when put under an obnoxious monument, dynamite dug a big hole in the ground, and pulverized the bottom stones of the monument, but did no further damage. In another case, exploded against the wall of a public edifice, it made a small opening in the immediate adjacent masonry—and that was all. In the recent railway road tunnel experiment of the Boers, the collision and the dynamite together doubtless made scrap iron of the two locomotives, and track ballast of a considerable amount of the rock in the immediate vicinity; but unless the locality of the explosion had been skillfully selected, with a view to collateral results, it is highly improbable that anything more than the clearing away of the rubbish (and, perhaps, some fresh support for walls and roof) would be required to make the tunnel commercially useful again.

The statement of the Transvaal engineer as to the

practicability of the "destruction" of a large number of mines in two days may be taken with much allowance. Unless very elaborate and extensive preparations had been already made, and made with much skill, his threat indicated either cheek or ignorance only. Even if such preparations had been made, the rapid and general destruction which he describes as practicable would be so only if innumerable separate and widely-scattered bore-holes, already charged with dynamite, were waiting only for the electric spark to fire them simultaneously. But no sane engineer would dare to create and maintain such a situation as that for more than a day.

The probability, amounting almost to certainty, is that such attempted "destruction" would amount to nothing more than the partial or total wreckage of machinery and buildings, and the production, here and there, of local and limited caving of ground. This would have caused, no doubt, delay and expense in the resumption of mining operations; but it would not by any means have extinguished the Witwatersrand as a source of gold for the use of the world.—Science and Art of Mining.

The English Admiralty have not yet concluded their experiments with the "Belleisle." The craft, which was riddled by the gun-fire of the "Majestic," is being patched up and will then be towed into Portsmouth Harbor and have her torpedoes exploded in her tubes. The Naval Department is desirous of ascertaining exactly what would be the result, if such an untoward accident as the premature explosion of the torpedo in its tube occurred during an actual engagement.

The Current Supplement.

The current SUPPLEMENT, No. 1288, is of unusual importance. "Germany's First Cable-Laying Steamer" is elaborately illustrated. "American Engineering Competition" deals with structural steel work. "Contemporary Electrical Science" is a series of short notes on electrical topics. "India Rubber at the Paris Exposition" is a valuable technical article. "The French Mission to Yunnan" is a profusely illustrated article. "Dairy Development in the United States" is a full article upon the subject.

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RECENTLY PATENTED INVENTIONS.

Agricultural Implements.

BAND-CUTTER AND FEEDER.—JOHN ERICKSON and JAMES MCC. EDMONDSON, Gardner, N. D. In this apparatus the grain-bearing straw is delivered vertically to the cylinder, dropping from the carrier to the cylinder a predetermined distance. Retarding devices engage the straw before it reaches the cylinder, thus giving ample opportunity for all loose grain to drop out from the bundle and be conducted to a suitable point without necessarily being passed between the cylinder and the concave. The machine is so constructed that the straw will spread before it strikes the cylinder, whereby the motion of the cylinder will distribute the straw more evenly and gradually than heretofore and will also prevent the slugging which invariably occurs when the straw is fed from directly in front of the cylinder.

HAY-RACK.—ALEXANDER FERGUSON, Odell, Ill. The purpose of the invention is to lessen the difficulty usually experienced in placing a hay-rack upon a wagon and running it therefrom, which is accomplished by making the rack in sections and providing fastening devices so constructed that the sections may be firmly locked together and readily separated, thus enabling the rack to be adjusted in sections upon the body or running-gear of a wagon in a convenient and expeditious way.

MOWING-MACHINE SEAT.—NATHAN BAUGHMAN, Hammersley Fork, Penn. In mowing-machines it is desirable that means be provided whereby the seat can be readily adjusted or rocked to secure the desired level position. The seat in this invention is pivotally supported so that it can be rocked from side to side and provided with a depending transverse rib or bearing extending on both sides of its pivot. A cam engages the rib on opposite sides of the pivot of the seat, so that it can rock the seat from side to side, but not tilt it from front to rear.

Mechanical Devices.

CENTRIFUGAL WATER-CLARIFIER.—FRANK H. RICHARDSON, Pueblo, Col. The device is designed to remove solid matter and impurities from water. The clarifier comprises a casing mounted to rotate relatively to a main or supply-pipe. Automatically-actuated valves permit the escape of separate material. The device is arranged in a well on the top of which are rollers engaged by the periphery of the casing to prevent vibration.

TOBACCO-SEPARATING MACHINE.—LUIS R. SCHOLTZ, Caracas, Venezuela. This machine is especially adapted to separate tobacco or picadura from the

wrappers of such cigarettes as are delivered from cigarette-making machines in a non-marketable condition, thus enabling the picadura to be again utilized. When thus used over again, the picadura is improved; for it is freed from dust. The machine is provided with means for collecting and retaining the tobacco-dust, which may be utilized in the manufacture of snuff.

FIRE-ESCAPE.—THOMAS T. BROWN, Euclid, Minn. In this fire-escape, a rope is used in connection with a friction device arranged to move relatively to the rope, so that a person attached to the friction device may descend gradually to the ground. The novel features of the invention are to be found in the construction of the friction-device so that it is rendered both durable and certain in action.

MARINE-DUMPING VESSEL.—FRANKLIN H. BULLIS, Brooklyn, New York city. The vessel is arranged to dump the load from the top instead of from the bottom and to insure a perfect discharge of all the mud, city refuse, or other matter forming the load. A single operator can manipulate and discharge the load with the greatest ease. On the deck of the vessel are two receptacles having their backs abutting and mounted to swing transversely in opposite directions from a loading to a dumping position and vice versa. By arranging the receptacles and their operating mechanism on the top of the hull, it is evident that they can be repaired at any time without requiring docking of the hull.

SAWMILL.—LEE W. DICKEY, Scottown, Ohio. The invention provides a peculiar construction of sawmill, enabling it to be readily transported from place to place, and a novel feed-gearing for effecting the proper movement of the carriage. The mill comprises a saw-box formed of joists and cross-beams extending between them at one end of the saw-box. Journals projecting inwardly from the joists at the other end of the saw-box are adapted to carry wheels on which to mount the rear portion of the saw-box. A reach is attached to the beams and projects forwardly to carry a wheeled axle to support the front of the saw-box so as to facilitate the transportation of the saw-box.

CHUCK.—ANDREW DINKEL, Auburn, N. Y. This chuck is particularly adapted for holding work, the center of which is to be bored—for example, for holding a gear while the hub is being bored. The inventor employs a number of radially-movable jaws which advance to grip the work and retract to release it, and which are acted upon by tangentially disposed links connected with a member which moves circularly with respect to the body of the chuck. The chuck is also fitted with a means of centering the drill, causing it properly to engage the work.

Railway Contrivances.

LOCOMOTIVE BUFFER-BEAM.—JAMES F. DUNN, Salt Lake City, Utah. The buffer-beam is cast in steel and so constructed that all its parts are comprised in an integral casting to which the proper parts of the engine may be directly attached. It is one of the purposes of the invention to protect the cylinder-heads, boiler-head, and adjacent vital parts of the locomotive in case of collision.

AUXILIARY CAR-MOVER.—PATRICK RYAN, Manhattan, New York city. The object of the device is to assist the motive power in propelling a car up grade when the tracks are slippery. On the inner side of each car-wheel an eccentric is fastened; and on the car-axle two eccentrics are secured. An eccentric strap is loosely mounted upon each eccentric on the car-wheels and on the axle. And upon each eccentric-strap a pusher-bar is secured. If the car-wheels slip, the pusher-bars, if resting with their free ends upon the road-bed, will successively push so as to coast with the regular motive power.

ELECTRIC RAILWAY SYSTEM.—GEORGE L. CAMPBELL, Manhattan, New York city. The invention is an improvement on a system previously patented by Mr. Campbell, in which a closed conduit is employed having a continuous main conductor and a sectional surface conductor. In the conduit a trolley is caused to travel with the car by the influence of a magnet on the car. In the present invention, Mr. Campbell has been concerned chiefly with the provision of an arrangement which insures the proper feeding of the current from the main conductor while the car is in proper running condition and instantly causes a dead rail when the car leaves the track or the magnets lose their power.

Miscellaneous Inventions.

APPAREL-COAT.—DANIEL MURPHY, 1307 E. Franklin Street, Richmond, Virginia. To avoid the dropping or the raising of the shirt-sleeve cuff from its proper position in the coat-sleeve, the inventor has designed a peculiar formation of the inner surface of the coat-sleeve and attached the cuff directly to it, instead of to the shirt-sleeve. This insures an invariable projection of the cuff below the coat-sleeve, and allows the cuffs to be put on or off with the coat. The coat-sleeve has buttons secured to the interior thereof, and fastened to the edges of the cuff. A flap fixed to the inner side of the sleeve above the buttons has buttonholes which register with the buttons, and are adapted to fold down over the upper edge of the cuff, and covering and retaining the cuff by being fastened to the buttons.

PROCESS OF TREATING GOLD AND SILVER ORES.—HENRY HIRSCHING, Salt Lake City, Utah. Mr. Hirsching's invention is a process for treating copper ores, principally to extract the cupric oxide, but also to obtain gold and silver from ores containing the oxide whether with or without copper. It consists in adding the small broken ore gradually under agitation to an ammoniated solution, diluting the solution, and separating it from the slimes. The slimes are washed separately and their residue heated to recover the ammonia therefrom. The process can be used to advantage and economy with refractory ores from which copper could not be profitably secured by melting and by other methods hitherto employed.

CURTAIN-POLE.—KATE R. BROADSTREET, Grenada, Miss. This curtain-pole consists of a tubular back-bar connected with a tubular front-bar. Each bar is provided with a guideway for curtain-hangers. When curtains are hung on this apparatus they can be shifted in various ways and reversed, crossing one another at the pole; or they can hang in the same horizontal plane, edge to edge, at the top or be bowed outwardly to produce a bow-window effect. The pole can be supported by ordinary brackets.

OIL-GAS LAMP.—ALBERT S. NEWBY, Kansas City, Mo. Two patents have been granted to Mr. Newby for lamps in which vaporized oil is used as the illuminant. In both lamps the burner is placed above the oil-reservoir, the oil being forced by air-pressure through a pipe leading above the burner, so that the flame can vaporize the oil. The feed of the oil is regulated by a needle-valve. In the one case a mantle is used; in the other an ordinary flame of high candle-power is produced. Both lamps are exceedingly efficient and are particularly serviceable for out-door use, since they cannot be blown out by any wind. The lamps are so constructed that they can be readily taken apart whenever it is desired to clean the parts.

Designs.

SKIRT-HANGER.—ARCHIE L. ROSS, Manhattan, New York city. This skirt-hanger is so designed that a number of skirts can be properly hung in a closet so that they will take up as little room as possible.

PIN.—JOSEPH COHEN, Brooklyn, New York city. The pin is intended for use in connector with campaign-buttons. Instead of the single point previously employed, two points are used, whereby the button is far more firmly held in place than heretofore.

NOTE.—Copies of any of these patents can 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.