

Self-motive Carriages and Electric Accumulators.

The foolish race, writes M. Hospitalier in *L'Industrie Electrique*, that has just taken place between Paris and Bordeaux and back, has brought out incontestably the advantages, henceforward indisputable, of petroleum, or more correctly, of the essence of petroleum or gasoline; it has relegated steam to the second rank and placed electricity much lower still on the list, for a partisan of this mode of locomotion, as bold as rash, presented a carriage which would traverse the 1,775 kilometers of the course, if not in the 100 hours allowed to competitors, at any rate in a time more suited to the future applications reserved for self-motive carriages on public roads.

We need not wonder at the almost entire absence of electricians from this competition, the object of which still remains a mystery to many, and to some a bitter deception.

As regards the bicyclette, the interest attached to the races is, and should only be, ephemeral; practical applications only will survive, and the competitions that present the most practical character are those that will render the greatest service to the development of self-motive locomotions, the dawn of which is appearing at the end of this century. From this point of view, the competition of carriages without horses, instituted last year by the *Petit Journal*, was much more useful, and responded far better to a real want than the Paris-Bordeaux-Paris race.

But long races from town to town, and long trials of speed over long distances, are not suited to electric carriages deriving their electrical energy from accumulators; these carriages must really be placed on the same footing with carriages drawn by horses which start in the morning and return to the coach house at night, so as to recuperate during the night the energy expended during the day. And, again, these carriages are only suited to applications for conveying people either for purposes of business or pleasure; in a word, we want to realize the electric cab or carriage. For conveying goods, the place is already filled and well filled by the gasoline carriages which are already used by a number of firms for their town deliveries.

A few general figures will suffice to show the superiority of gasoline from a mechanical and economical point of view.

The motors of 2 to 5 horse power used on the gasoline carriages consume about 500 gr. of a density of 0.7 per mechanical horse power hour available on the axle of the motor.

Taking transmissions into account, when considering the efficiency, 1 kg. of gasoline represents at least 250,000 kgm. available at the rim of the wheels. With the boilers used on the steam carriages, 1 kg. of good coal produces at most 6 kg. of steam, and the non-condensing motors consume at least 18 kg. of steam per horse power hour, or 5 kg. of coal per horse power hour. One kg. of coal, therefore, produces at the most 90,000 kgm. on the motive axle and 50,000 kgm. available for traction at the rim of the wheels, taking transmissions into account.

An electric accumulator produces now a maximum of 15 ampere hours at 2 volts, or 30 watt hours, or 18,000 electric kgm., which represents 5,000 kgm. available at the rim of the wheels, taking into account the efficiency of the motor and transmissions. We may assume that the weight of gasoline, steam, and electric motors are to all intents the same, but the petroleum motor necessitates the transport of a certain quantity of water for cooling purposes, and the steam engine that of a still larger quantity of water to be converted into steam on the journey, while with the accumulator we must transport a considerable and constant weight. It follows from this that the figures 250,000, 50,000, and 5,000 do not represent the respective values of the mechanical energy utilized in the three kinds of self-motive carriages. A closer comparison lowers the comparative value of the steam engine, and raises that of the petroleum engine, since the latter has not to carry uselessly, like the accumulator carriage, a considerable dead weight, the transport of which absorbs the greater part of the available energy.

These figures show that there is no chance of competition between the accumulator carriage and the gasoline carriage in a speed test like the Paris-Bordeaux-Paris race, and they justify the almost entire absence of the former, for only two carriages of the kind were entered, and only one really took part in the competition, arriving at last at Bordeaux after numerous mishaps on the way. But steam has many objections which it would be puerile to mention; petroleum engines have to be started by hand after each little stoppage, they are noisy and productive of much jolting; they exhale an odor which is far from agreeable, and often they can only be persuaded to ascend hills of any steepness on the condition that the passengers are obliging enough to dismount, and sometimes even push the vehicle.

While rendering all due honor to gasoline, and sincerely applauding its success, and notwithstanding the

unfavorable figures that we have just quoted, electrical carriages offer such advantages as regards comfort, convenience, simplicity of manipulation, etc., that we must still persist in believing in their superiority for a metropolitan service in large towns provided with distributions of electrical energy. The electric carriage will best solve the problem of the electric cab, the possibility of realizing which we suggested in 1881, and which, it seems, is on the eve of being realized in Paris itself. *Qui vivra verra.*

Electrocution of Shade Trees.

It is a question whether the stringing of electric wires in cities and villages will not destroy a large proportion of the shade trees. Complaint is made in several cities that where the wires pass through the foliage the trees in nearly every instance have died, presumably from the effects of the electric current. It has been noticed also that the death of the trees almost invariably follows a season of rain, when the wet leaves are good conductors of electricity and carry it from the wires to the trees. In some cases the death of trees has been caused by wires supposed to be thoroughly insulated, the covering having been rubbed off the wires by the friction of the branches when moved by the wind.

The evidence that the trees have been killed by electricity is furnished by the fact that in numberless instances the trees through which the wires pass died in an hour during a storm, while those standing a few feet from the wires were uninjured. These results will raise the question as to the liability of electric light companies for the damage caused by the killing of shade trees. The right to string electric wires does not give the further right to destroy the shade trees, which may constitute the chief value of a piece of real estate. Neither does it give the right to lop off the branches and otherwise disfigure ornamental trees simply because such branches happen to be in the way of the wires. This has been done by an electric light company in one of our suburban villages, and many large and beautiful trees have been practically ruined by such vandalism.

This destruction of trees is quite likely to lead to expensive litigation before a property owner's right to receive damages for his loss is established by the courts. A good deal of trouble could be avoided if electric lighting and power companies would take pains to place their poles and string their wires so as not to interfere with the ornamental trees along their lines.—*Chicago Record.*

RECENTLY PATENTED INVENTIONS.**Railway Appliances.**

CAR MOVING BAR.—John McFarland, Austin, Canada. For moving and shifting cars in railway yards, this invention provides a bar or lever in which fitly independent jaws adapted to rest on the rail and grip it on opposite sides, a spring connecting the lever with the shanks of the jaws. When the lever is placed on or over the rail and the handle pressed slightly down, the lever acts in a wedge-like manner on the jaws and causes all the weight to be converted into grip on the rail, the grip being automatically released by the action of the spring when the pressure is removed.

QUICK ACTION BRAKE VALVE.—William Hirst, Trenton, N. J. This invention covers an improvement in triple valves, whereby the pressure in the brake cylinder is retained at all times up to the required full working pressure. It provides a retaining valve in the form of a spring-pressed piston valve arranged in the triple valve exhaust and normally held in open position by pressure from the train pipe, the valve, on reduction of pressure in the train pipe, connecting the triple valve exhaust with a port leading to the main reservoir and the brake cylinder.

Electrical.

ELECTRIC TARGET.—Milton T. Weston, Kenton, Ohio. This invention relates to pleasure ground targets to be struck by a spear or wand, or targets for shooting galleries. A circuit closer is actuated from the bull's eye and is so connected as to actuate an alarm, and also, through an electromagnet, release a hanger, whereby a prize will be presented to the one making the bull's eye. The alarm bell and the magnet may be placed above and alongside of the marksman, the bell ringing and the prize dropping by his side on a successful shot being made.

Mechanical.

DOWELING MACHINE.—Christian Loetscher, Dubuque, Iowa. To drive dowel pins into mortised joints in sashes, doors, etc., this inventor has devised a machine in which an inclined spout feed device is grooved to permit the lengthwise sliding of a dowel, a stop plate at the lower end of the spout having an aperture registering with its groove, while a feed tube connected with a plate extends substantially in alignment with the lower end of the groove. The machine has a hollow head in which is a movable plunger, a collar movably relatively to the head being controlled by the plunger, and the head and collar having a dowel feed passage at an angle to the line of motion of the collar.

HAND DRILL.—Robert Binnie, Bolivar, Pa. To facilitate drilling in rock, etc., at any angle, without danger of the drilling tool getting stuck in the hole, the drill shaft is mounted in a carriage on a frame, and on the drill shaft is a sliding frame provided with

wheels, cams on the driving shaft engaging the wheels, and there being a worm on the driving shaft and a worm wheel in which the drill shaft slides, the shaft having a key and groove connection with the worm wheel. The drill can be readily set in any desired working position, and is easily moved about from place to place.

Miscellaneous.

WAR SHIP.—George W. Van Hoose, Tuscaloosa, Ala. To enable the whole armament of heavy guns of a ship to be fired at once in any direction, this invention provides a form of turret and barrette in which the turn table of the turret always remains below the upper deck and protected by the barrette, the gun carriage and its housing rising above the deck when firing and falling below it at other times, so that one set of guns adjusted to the higher position may fire directly over another lower set of guns. A special form of barrette, and of turn table with gun carriage and housing, are provided, and special hydraulic devices for raising and lowering the guns and their housings.

WOVEN CHENILLE FABRIC.—Leedham Binns, Philadelphia, Pa. This is an improvement on former patented inventions of the same inventor, providing a fabric having a fine appearance and adapted to be formed in various ways to produce a large variety of styles. It comprises a continuous web on opposite sides of which at intervals are arranged separate sets of warps, wefts being interwoven with the separate sets of warps, while the ends of the wefts project from the outermost warp threads to form tufts.

LOG HAULING DEVICE.—Albert Van Duzer and Walter Kirby, Scotia, Cal. This is a simple attachment which may be conveniently applied to a cable and to a log to be hauled, and adapted to release and permit the logs to slide freely down a steep grade, the attachment being such that the cable cannot get beneath the log, but will always be in position to do the most effective work.

TYPEWRITER COPYING ATTACHMENT.—Charles H. Keith, New York City. According to this invention, a frame applicable to the carriage has a brace to hold it in the position of use and a roller to receive either a duplicating belt of carbon paper extending around the platen roller, or a belt saturated with copying compound, a supply roller to be filled with copying paper, a receiving roller to receive copy paper after the impressions are made on it, and spring-actuated mechanism to turn the receiving roller and cause it to automatically take up the copy paper as it is carried forward by the platen roller in the regular operation of spacing the lines.

ARCHES, PARTITIONS, ETC.—Foster Milliken, New York City. For such constructions this inventor provides a combination of cement and concrete with wrought iron or steel which will develop the full strength of all the materials. The invention consists in corrugating wire or similar material reinforced at its corrugations, bending the corrugated material to shape and bedding the reinforcing material and corrugated material with cement or concrete. The construction is also suitable

for roofs, domes, sides of buildings, vault light work, etc.

VEHICLE TOP BOX OR RACK ATTACHMENT.—Lawrence H. Hansen, Viborg, South Dakota. For farm wagons especially this invention provides a means whereby an upper structure may be readily attached to the wagon body, to afford a high body for the carriage of cattle, corn, grain, etc., the sides and ends of the body extension to be dropped down and held at an angle, adapting the vehicle for hauling hay, straw, etc. Locking devices are provided whereby the body extension may be held firmly in whatever position it may be placed, and the upper structure held rigidly in either its expanded or its closed folded position.

GLUE STOCK CUTTER AND FEEDER.—Peter Cooper Hewitt, New York City. By this invention an apparatus is provided by which glue stock may be taken from the washer, conveyed to a cutter and held in position to be acted on by the knives. The cutting machine has a series of circular cutters, a series of serrated disks for holding the stock while it is being cut, a glue stock conveyor consisting of endless belts extending between the disks, guards between the cutters preventing the stock from being carried around by them. Adjustable gearing connects the shafts of the cutters and disks for regulating the position of the cutters relative to the disks.

BOX LID RAISER AND FASTENER.—Charles L. Feinberg, Brooklyn, N. Y. According to this invention, a catch is fixed to the body of the lid and a keeper to the adjacent portion of the box body, there being combined with the keeper a spring capable of raising the lid on the disengagement of the catch and keeper. That portion of the body which carries the keeper is yielding, so that it may be moved to engage or disengage the catch and keeper, the automatic raising of the lid being simultaneously effected with the release of the fastening device.

CURTAIN FIXTURE.—Delbert B. McCapes and Edward D. Quinn, Vermillion, South Dakota. This is designed to be a handsome attachment to be applied to the outer or inner face of the window frame to hang an ordinary window shade roller in, so that it may be readily adjusted vertically to bring the roller to the desired height. It comprises a slotted barrel in which slides a bracket projecting through the slot, means for fastening the barrel to a support, and an adjusting rod extending upward into the barrel and connected with the bracket.

CAPSULE FILLER.—Albert M. Ingalls, Duluth, Minn. This improvement comprises a funnel having at its outlet end an expansible and contractible tube to receive and hold by contraction a capsule body while being filled, and a double-ended reversible rammer with a longitudinal bore serving as an air vent. It is easily operated and simple in construction, and facilitates the rapid filling of capsules with the desired amount of medicinal and other material.

DENTAL MATRIX.—Joseph M. Strout, Portland, Me. A matrix retainer, comprised in this invention, can be set up by the fingers in like manner as a

wrench, and placed in position as a napkin holder and cheek distender, or it may be turned down close to the gum, being quickly adjustable on either the upper or lower teeth or the buccal, lingual or palatine surfaces and crosswise of the teeth. The matrix is inexpensive and is made in sections united at one point in their length in a manner to be readily disengaged when withdrawn, obtaining the result of a band matrix, yet possessing the advantages of a two-piece matrix.

GAME COUNTER.—William F. Hoehspeier, Jersey City, N. J. This device comprises a board on which are parallel rows of figures, one row having its figures in groups or series and the other having figures to correspond to those in the groups of the opposite row, there being tilting angular finger pieces pivoted between the rows. It is intended for use in games where successive amounts are made to complete a final total.

GAME COUNTER.—Joseph Voelker, Pittsburg, Pa. This device has a shallow cylindrical case whose cap piece has a single orifice, an inverted concave bell being held within the case and a dial rotating on the post, while a series of indicators is adapted to successively appear at the orifice in the cap piece, being moved with a step by step movement by actuating mechanism within the bell, as the player presses upon a finger piece projecting from one side of the case.

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

NEW BOOKS AND PUBLICATIONS.

THE MINERAL INDUSTRY, ITS STATISTICS, TECHNOLOGY AND TRADE IN THE UNITED STATES AND OTHER COUNTRIES TO THE END OF 1894. Vol. III. Edited by Richard P. Rothwell. New York: The Scientific Publishing Company, 1895. Pp. 770. 8vo. Plates, illustrations and tables. Price \$5.

To the engineer, the chemist, the metallurgist, the buyer, the seller of minerals, the investor in mineral property, and to the legislator who should know the resources and conditions of production in every country, this work is absolutely indispensable. This is the third volume of "The Mineral Industry," and brings the subject up to date. The work describes the occurrence and character of deposits in which the useful minerals are found, the characteristics of the mineral, the methods of mining, treatment of ores, characteristics of metals, costs, uses, statistics of production, import and export, consumption, review of mineral, metal and mining stock markets, assessments by mining companies and dividends from 1884 to 1894. To this are added extremely valuable technical articles by the most competent authorities, giving the most recent progress in each department of mining, metallurgy, and chemical industry, thus bringing the technical literature up to date. The tables of itemized cost production of many of the minerals and metals afford information of the utmost value to all interested in the in-

