

ENGINEERING INVENTIONS.

An improvement in presses for compressing meal, bran, cotton seed, sawdust for fuel, and other materials into cakes, has been patented by Mr. John W. Fredrick, of Indianapolis, Ind. This invention relates to hydraulic presses used for compressing various materials into cakes, and has for its object the quick removal without breakage of the compressed cake. The material to be compressed is packed within a press box, which is open at its ends, and the box then placed on one of its ends within a cap which is mounted on the ram. Power is next applied to the ram to raise the box on a fixed cylinder, which enters the box at its opposite end. When sufficient pressure on the material has been thus obtained, the box is further raised by supplementary means, and blocks are arranged between the cap and bottom of the box and the ram again raised, which causes the compressed cake to be forced out of the bottom of the box. The invention is a perfectly practicable and useful one.

An improved car coupling, which combines with it a cushioned bumper and furnishes a yielding drawhead, has been patented by Mr. Darwin S. Walrath, of Ingham's Mills, N. Y. In this coupling the frame of the device and drawhead are mounted in slots formed in the beams of the car platform, with a spring between them, and both have a limited longitudinal movement in opposite directions. When the cars are ready for coupling, a crossbar, which engages the connecting bolt, rests on a table formed on the bumper head which has been forced forward by the spring of the intermediate bumper when the crossbar was raised by an uncoupling lever. The cars having been brought together the connecting bolt or link enters the bumper head and forces it back against the bumper, which is a double or compound one, the springs of which absorb the concussion. In the meantime the crossbar has dropped from its supporting table into position in front of a projection on the connecting link, which is thereby prevented from being withdrawn. One of the springs of the compound bumper is heavier than the other, so that the power for drawing the car will come against the rearward thrust of that spring, which thus furnishes a yielding draw for the car.

In improved sectional steam boiler, which is economical of fuel, quick to generate and superheat steam, easy of repair, and occupies but little ground room, has been patented by Mr. Milton W. Hazelton, of New York city. The body of the boiler consists of a central upright cylinder provided with a series of radiating tubes, closed at their outer ends and arranged in successive planes one above the other, the tubes and spaces of the several series alternating with each other. A series of vertical tubes are set in the spaces between the outer ends of said radiating tubes, and arranged to extend from near the water line above these tubes to the bottom of the central cylinder, and communicating at their ends by horizontal pipes with said cylinder. A tubular water jacket is formed around the fireplace by a double series of vertical and horizontal pipes connecting with the central cylinder, and the steam chest, at top of the boiler, is fitted with vertical smoke-flues for superheating the steam.

Mr. Charles Ebel, of New York city, has patented an improved hydrant. This invention provides, in a very simple and effective manner, for emptying the nozzle pipe of a hydrant of water in cold weather, to prevent injury from freezing. To this end the stem of the valve which controls the admission of water to the nozzle pipe is extended downward below said valve, and carries on its lower end a reverse valve which, when the nozzle pipe valve is closed, opens communication between a lower extension of the nozzle pipe and a waste chamber, which is arranged below it, and which is fitted with a pipe that connects with the sewer, thus allowing any water that may be left in the nozzle pipe to run off. A separate valve is used to close this pipe that connects with the sewer whenever it is not necessary to empty the nozzle pipe, as, for instance, during warm weather.

An improved car coupler, which is simple, strong, and durable, and allows of the cars being coupled and uncoupled without dangerous exposure to life or limb, has been patented by Mr. Oliver S. Riggs, of Allentown, Pa. This invention relates to that class of couplers called "self-couplers;" and it consists of a flaring mouthed drawhead containing a pivoted elbow drop-catch for engaging the coupling link, held down by rod and spring and raised by lever, and containing, also, a curved plate rigidly secured in rear of the drop catch for guiding the coupling link and holding down its engaged end. The lever which raises the drop-catch is an elbow one arranged on the exterior of the drawhead, and may have attached to it a rod extending forward for the engineer to uncouple the cars while in motion.

Mr. William Johnstone, of Ottawa, Canada, has patented an improved steam boiler. The invention consists in a combination with an upper cylindrical chamber, which forms both a water and steam receptacle, of an annular lower water chamber surrounding the grate, upright water tubes connecting said chambers and forming the exterior wall of the boiler, drop tubes for containing water depending from the upper chamber into the fire chamber, and a series of short upright tubes projecting from the lower annular chamber at the feed opening to the fireplace and connected by a cross pipe with the upright tubes which connect the upper and lower chambers. This constitutes a cheap and efficient boiler for generating steam for mechanical uses, for heating dwellings, and for other purposes.

An improved boat lowering and detaching apparatus, which is both rapid and safe, and is automatically released when the boat touches the water, has been patented by Mr.

Albert Willis, of Colusa, Cal. The invention consists in an upright at each end of the life-boat, to the top of each of which uprights a short arm or beam is pivoted, the loose end of which passes into an aperture in a beam pivoted to the lower end of the upright, this upper beam being held in the aperture by a safety chain and by a pintle passing through a ring attached to a string or chain fastened to the davit, whereby when this string is drawn taut by the descending of the boat the ring pulls the pintle out of its aperture, so that the lower beam can drop when relieved of its strain—that is, when the boat floats—thus permitting the upper arm to swing upward and the ring of the pulley block to slide from a hook on the upper pivoted beam, thereby causing the boat to be detached from the pulley.

Messrs. Watson P. Widdifield and Anson T. Button, of Uxbridge, Ontario, Canada, have patented an improved car brake. The object of this invention is to provide an efficient car brake which will permit the brakes to be applied simultaneously to all the cars of a train from a single point, and with an equal pressure. The brake is of that description in which a continuous rod, formed of sections, extends longitudinally with the cars, and is jointed between the latter, said rod sections being coupled for rigid rotation with each other and connected with devices for rotating the rod, and also to the brake devices. The invention consists in a combination with the brake devices and a rotary gear operated directly by the axle for applying them, of a continuous rod or shaft extending throughout the length of the train, and an equalizing device placed between the said continuous rod and the rotary gear. It also includes a coupling of novel construction for the continuous rod, and various other details and combinations, which add materially to the efficiency of the brake.

Mr. Isaac H. Allfree, of Pittsburg, Pa., has patented a very useful valve and valve gear for steam engines. The invention relates to an improvement in valves and valve gear for steam engines, designed to secure a balanced action for the valve, a reverse movement for the engine, and an automatic variable cut-off with great economy of material and space, as well as great simplicity of parts. It is more particularly intended for upright engines. In it the steam cylinder, main valve casing, and reversing valve casing are all cast in one piece in the form of parallel cylinders, and provided with transverse external ribs to form steam ports. The main valve casing is made longer than the steam cylinder, which has ports at its ends, and the reversing valve casing has ports opening into the end and middle of the main valve casing, and both casings are fitted with balanced piston valves, which are double headed and tubular. The invention also includes a combined reversing and cut-off valve and a variable cut-off gear arranged in line with the valve and connected by reciprocating rods or stems having an adjustable connection between them. Means also are provided for definitely increasing or shortening the distance between the valve and its variable cut-off, whereby the valve may be reversed at will and the cut-off gear still be made to coact with said valve in either of its positions. The invention likewise includes other new and useful features.

Action of Coffee and Sugar on the Stomach.

M. Leven has communicated to the Paris Society of Biology some experiments which he has made on this subject on dogs, with the assistance of M. Semerie. The action of coffee on the stomach has been much discussed and variously interpreted; the majority of writers admit that coffee stimulates the circulation and provokes hyperemia of the gastric mucous membrane, but they have not adduced experimental proof of the fact.

The contrary opinion is supported by a certain number of observers, to whom M. Leven has given in his adhesion. He recalls to mind the experiments which he made some years since on caffeine absorbed by frogs, guinea pigs, and rabbits. It retarded the action of the heart, which, at the same time, became strong; it increased the arterial tension; like the vaso-constrictor agents, it dilated the pupil. Caffeine has even been used in certain cases to replace digitaline, of which it has, to a great extent, the properties, though in a smaller degree.

The latest experiments of M. Leven were as follows: He gave to a dog a meal of 200 grammes of meat; he then administered an infusion of 35 grammes of coffee in 150 grammes of water; the animal was then killed, and, at the end of three hours, the stomach still contained 145 grammes of meat, while in the absence of coffee it only contained about 100 grammes. The abdominal mucous membrane was pale as well on the external surface as in the interior, and the vessels were strongly contracted. It follows, then, that coffee, producing anæmia of the stomach, retards digestion; and, he anæmia repeating itself, ends by bringing on habitual increased congestion of the stomach, which, according to M. Lever, is synonymous with dyspepsia.

It is well known, and English physicians have laid great stress upon this point, that the abuse of coffee and tea often brings on gastralgia, dyspepsia, and, at the same time, more or less disturbance of the apparatus of innervation. It is, therefore, necessary precisely to distinguish the local anæmia produced by coffee on the stomach from the more general action exercised by it over the central nervous system, and which has conferred on it the merited qualification of an intellectual drink. In opposition to coffee, sugar is, according to M. Leven, an eminently digestive substance; and he does not fail to order it in certain cases of dyspepsia. He

has made the following experiments: He gave to a dog 80 grammes of sugar at the same time as 200 grammes of meat; six hours afterward there was nothing found in the stomach but 20 grammes of undigested meat. The abdominal mucous membrane was red and turgid, the liver was wholly congested.

M. Leven draws this practical lesson from his experiments: that the infusion of coffee should be sufficiently sweetened to stimulate the secretory function, and thus assist digestion.—*British Medical Journal*.

The Treatment of Burns.

The *London Medical Record* says that Dr. J. Troizki, in a Russian medical journal, adds his testimony to that already published as to the value of solution of bicarbonate of soda as a dressing for burns. He says that during the previous year he noticed twenty-five cases of burns, mostly of a severe nature. Sixteen of them were received in a fire in a village, during a strong wind, when the inhabitants, in order to save their property, were obliged to work in the flames. In all these twenty-five cases bicarbonate of soda was exclusively applied. The result of this treatment was so favorable that the author considers himself justified in pronouncing this remedy the best and most efficient in burns of all kinds and degrees. Even in extensive burns of the second and third degrees the pain was soon alleviated by the application of compresses soaked in a solution of bicarbonate of soda; and the wounds soon healed, leaving but few scars, and no impairment of the functions of the affected parts. No evil results from this extensive use of bicarbonate of soda, which might suggest the reception of carbonic acid into the blood, were noticed.

As regards the application of bicarbonate of soda in burns, the author distinguishes three methods: (1.) Powdered bicarbonate of soda is strewn over the burned parts (2.) Linen rags, sprinkled with a solution of bicarbonate of soda (1 in 50) are laid on; as soon as these rags become dry they are replaced by others, or are moistened again in the solution. (3.) Linen rags are applied in the same manner, but are kept constantly upon the burns, and moistened by pouring the solution over them. The first method suffices only for burns of the first degree. Change of the moistened rags is chiefly adapted for burns of the third degree, attended with much suppuration. In exchanging the dry rags the pus which has accumulated underneath them must be carefully washed off, that it may not be received into the blood; and then a fresh rag soaked with the solution must be placed upon the clean granulating surface. The third method is applied solely in burns of the second degree. Changing the compresses would in these cases only irritate the exposed surface, and, by causing a more copious suppuration, delay the healing process. The beneficent effect upon burns of the solution of bicarbonate of soda the author considers to be due to the anæsthetic, antiseptic, and disinfecting property which the bicarbonate owes to the ready disengagement of carbonic acid from it. Herr Troizki has also made experiments with other antiseptic and disinfectant agents, but has come to the conclusion that none are so useful as the soda.

Great Mortality from Snakes and Tigers in India.

It may be startling to Europeans to learn that no fewer than 21,990 persons were killed in India during the year 1880 by snakes and tigers. It is, too, at first sight, eminently unsatisfactory to hear that this loss of life, instead of decreasing with the advance of civilization, has actually increased during the past five years; the number of victims in 1876 did not exceed 19,273. This statement appears almost incredible, and requires explanation, which will probably be found in the greater accuracy with which causes of death have been returned in India in recent years. The largest fatality from snakes and wild beasts occurs in the Bengal Presidency, where during last year 10,064 persons are said to have died from snake bites, and 359 to have been killed by tigers. It appears from the weekly returns issued by the Sanitary Commissioner of the Punjab that during the fortnight ending August 27 last no fewer than 113 deaths resulted from snake bites in fifty two of the largest cities of that province—equal to nearly 3,000 per annum. As the fatality from this cause is probably larger in the rural than in the town districts, it is evident that the province of Punjab must be responsible for a very large proportion of the excessive fatality from this cause in the Bengal Presidency.—*London Lancet*.

Gas Purification by Apatite.

It is announced in a recent number of the *Revue Industrielle* that the first cargo of 500 tons of Canadian phosphates, from the mines at Buckingham, province of Quebec, has been delivered at Bordeaux. Apart from the use of this mineral for agricultural purposes it is proposed to utilize the Canadian apatites (calcium phosphate) in the purification of coal gas, presumably from ammonia. If the process succeeds there will probably be a rise in the value of these phosphates, which already constitute an important branch of industry in the province of Quebec. It is not stated how the apatite is to be used in the purifiers, but it would probably be only employed somewhat after the manner of the artificial superphosphate process for the elimination of ammonia. The mineral will, therefore, be ground and employed in its raw state, with what success remains to be proved, since, although presumably cheaper than commercial superphosphate, it is not so pure and free from inert constituents as the artificial substance.