

Storm Window for Locomotive Cabs.

The Tinker Storm Window Company, of Springfield, Mass., are manufacturing a window for locomotive cabs on which frost will not form and obstruct the engineer's view. To the inside of a regular cab door is secured a specially designed window so constructed as to form a watertight space about five-eighths inch in width between the two panes of glass, which space is filled with water, or, if preferred, any other suitable transparent liquid. The water is heated sufficiently so that the snow, ice, frost, etc., will not adhere to the surface of the glass, thus providing a clear glass in front of the engineer during the worst storm or coldest weather. The necessary warmth is imparted to the water by a tube between the glasses, through which a small jet of steam passes.

When filled with water the appearance of the window does not differ from a single pane of plate glass. It is claimed to be easily regulated by the engineer, to require but little steam, and to accomplish its work in a most satisfactory manner.

A New Method of Preparing Diastase.

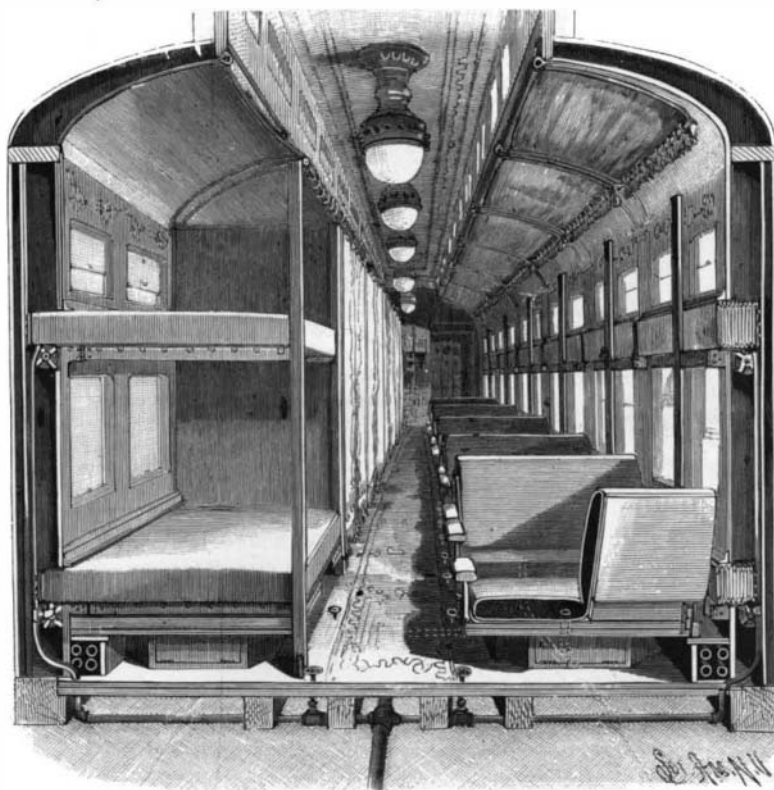
A new method of preparing diastase, the ferment which produces malting, has recently been discovered by Jokichi Tokamine, a Japanese who has studied in the universities of Glasgow and Tokio.

By cultivating a mushroom growth, *Eurotium oryzae*, on wheat bran he has found that at an early stage it bears on its roots minute crystals of diastase, while the unripe spores contain a powerful ferment. Diastase of sufficient commercial purity was obtained in considerable quantities by washing the bran and crystallizing the diastase from the solution. A mixture of equal parts of this diastase and crude wheat bran added in the proportion of 10 per cent of the grain mashed will produce, it is said, a more perfect conversion than 10 per cent of the best malt. The wheat bran after the fungus has been grown may be used for cattle feed. The ferment will continue to produce fermentation in a sugar solution until nearly 20 per cent of alcohol is present.

PNEUMATIC BERTHS AND CUSHIONS IN PARLOR CARS.

According to the improvement forming the subject of the accompanying illustration, the cushions for the seats, as well as the bed or mattress, in a combined sleeping and parlor car, are connected with the compressed air pipes of the train, and adapted to be inflated by opening suitable valves in connecting pipes, or be collapsed and compactly stored, according to the daily or nightly requirements in such service.

A patent for this invention has been recently issued to Mr. Linford F. Ruth, of Connellsville, Pa. The mattresses or bed cushions, and also the chair cushions, are simply air-tight bags of soft rubber or other suitable material, and from a main compressed air pipe running centrally under the floor three branch pipes lead to them in each car section, one of the branches supplying air to the two chairs and the other two branches supplying air to the upper and lower berth mattresses respectively. In each branch is a three-way cock for admitting or cutting off the air supply, and opening a vent or discharge. The mattress or berth cushion is creased to fold like an accordion, and is attached at the head and foot to a flexible strip winding upon the barrel of a spring, whereby it is drawn in collapsed condition into a covering or casing at the side of the car when not in use. To guide it to position and support it when extended, it has hooks which catch over transverse steel frame supports, connected at right angles to vertical standards adapted to fold flat against the side of the car. The entrance of the air causes the inflation and extension of the mattress, which at its outer edge is connected to a panel rail moving in and out with it, and on turning the valve to discharge the air, the mattress is drawn back in folded position by the tension of the spring. Each section has a base compartment under each seat for blankets, bed linen, etc., and the chair swivels on the base about the compressed air inlet pipe, the chair back frame folding forward when the cushions are collapsed. The cushions are distended or collapsed by the adjustment of the valves in the same manner as the mattresses are. The sections are separated by curtains arranged on vertical spring rollers, and the curtains that close in the sections from the aisle hang from a rod held by arms to rock in such way that the curtains may be swung back against the ceiling, as shown at the right in the illustration. This improvement is designed to not only save time and trouble in adapting any portion of the car to either use, as required, but is also calculated to render the car much more sanitary and comfortable.



RUTH'S COMBINED SLEEPING AND PARLOR CAR.

long series of experiments, has brought the Capo-Parad battery to its present state of perfection.

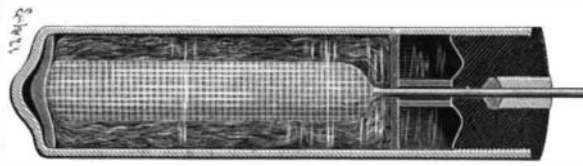
Work on an Ostrich Farm.

The ostrich farms of South Africa are very curious and interesting places. The equipments are generally very simple and inexpensive and the crop is found to be very profitable. The first requirement of an ostrich farm is a "camp" or pasture for the birds, and these vary in size from 3,000 to 8,000 acres. Such a camp generally holds comfortably about 300 ostriches. The camp must always be good pasture ground, and here the birds remain for the entire year, except when they are brought together once every four months to be plucked.

The ostrich builds its nest in the sand in a very care-

A COMPACT BATTERY.

In some things bigness is a valuable feature, in others, smallness is a desideratum. In the case of the battery herein illustrated, full size, we have what is probably the smallest, lightest, and most compact practicable battery made, while it yields a large current (2 amperes) at a reasonably high voltage (1.1 volts). It will thus be seen that while this battery is at one extreme in point of size, it is at the other extreme as regards the work it can do. It is capable of ringing a door bell for twenty-eight hours continuously, equal to about one and a half years in ordinary use. It will work a Faradic motor from 52 to 100 continuous hours, and 2 cells on a sparking coil in a gas light will



CAPO-PARAD BATTERY (FULL SIZE).

give nearly 360,000 ignitions. For testing and blasting it is found to be very efficient and convenient.

The battery consists of a zinc cell $\frac{1}{16}$ inch in diameter and $2\frac{3}{4}$ inches long, closed with a hard rubber stopper, and containing an electrode formed of fused silver chloride. The chloride is cast upon a zigzag silver wire, the straight end of which extends through a stuffing box in the cover, forming one pole of the battery. The zinc cylinder forms the other pole. The cylinder of fused chloride of silver is inclosed in a covering of textile material, and held in place by hard rubber disks at opposite ends. The disk adjoining the hard rubber stopper is held in place by a short piece of elastic tubing surrounding the silver wire. The space between the silver chloride and the zinc is filled with fibrous material which is saturated with the electrolytic liquid with which the cell is filled.

For many purposes where this battery is to be carried in the pocket, it is inclosed in a casing containing two, four, eight or more cells. A four-cell battery with casing weighs but five ounces.

These batteries are used in the Treasury Department and in other places in connection with small electric lamps for temporarily illuminating vaults, safes, etc. A single cell of this battery is so light that it may be mailed for two cents. It will work in any position, does not polarize, is not affected by climate, and the strength remains constant up to the moment of its final exhaustion.

Mr. James J. Pearson, manager of the Nassau Electrical Company, of 108 Liberty Street, N. Y., after a

less fashion and here it lays its eggs. The nest is crudely constructed, consisting simply of a round hollow carved out in the sand. Sometimes the female bird scratches this hole or nest, but the nest is generally formed by the birds having set continuously upon one spot for a long time. One bird will lay from ten to twenty eggs, but often three or four birds will lay in the same nest. Often there will be as many as seventy or eighty eggs in a single nest. In this case most of the eggs are taken out, since an ostrich cannot cover more than sixteen eggs. About forty-four days are required for hatching, and when a nest is hatched the little birds are brought under cover and fed. They are usually fed both morning and evening on barley or rape.

When the time comes to pluck the birds, the real work on an ostrich farm begins. They are usually rounded up by a number of men on horseback. At first they are very fierce, but when all are huddled together in a kraal every bird becomes docile and manageable. The birds are taken one at a time and a bag or stocking is placed over its head. It is then quickly clipped by two skilled attendants. The prime feathers are usually plucked in June. Prime feathers are the long white fancy feathers, and they number from eighteen to twenty on each wing. Four months after this picking the stumps of these feathers are drawn out, and two months after this the "primes" or short black tail feathers are taken out. The general rule in plucking is to obtain as many feathers as possible without injuring the ostrich or robbing the bird of a suitable winter coat.

The Cooper's Hawk.

Mr. Chas. B. Cook, writing to the Country Gentleman, says the Cooper's hawk so closely resembles the pigeon or sharp-shinned hawk that the two species may be economically treated together. The following description will apply to both species: Upper parts of the head, brownish black; back, bluish gray, with the upper side of the tail crossed by black bands; the lower portions white, with breast and sides marked with bars of red. The length of the Cooper's hawk varies from 16 to 20 inches; extent about 30. The sharp-shinned hawk measures about six inches less.

Both these species are very abundant over the greater part of North America. They are the hawks that are distinctively chicken hawks, and mostly responsible for the reputation that has been falsely conferred upon the beneficial species.

On the wing, these hawks may be distinguished from the beneficial sorts by their nervous, rapid and irregular flight. They have the habit of flying low, and are rarely seen soaring in the sky like their larger cousins. The subsist in the main on a bird diet, but occasionally insects and even small quadrupeds are consumed.

In some parts of the northwest the Cooper's hawk has earned a good reputation, but over the greater part of its range it is a terror to bird and fowl alike. Even the swift-flying partridge or grouse, fully aware of its enemy's presence, must be in a dense thicket to stand any chance of escape, and even then an escape is due to a timely drop into some brush pile, where its protective color and motionless form come to the rescue. When a sharp-shinned or Cooper's hawk attacks a flock of poultry, its visits are likely to be continued indefinitely. Dr. Warren states, in *Fisher's Hawks and Owls of the United States*, p. 38, that one pair "destroyed some fifty chickens from one farm, twelve of which were taken in a single day."

The sharp-shinned hawk is very fond of pigeons and often works fearful havoc among some fanciers' dovecotes. A few years ago the writer was watching a flock of doves feeding near, when a sharp-shinned hawk swooped down on one of them, but missed his bird, as the pigeon fairly brushed him off in flying through the lowest space in a board fence. The hawk followed, passing through the next space above, but evidently out of respect for the pigeon's presence of mind, he ceased pursuit and quietly fluttered off toward the woods.

Both the above species at times are exceedingly bold, and seem to depend on their rapid wings to carry them off in safety. A few years ago one was known to attack the person of Mr. C. D. Walcott, in Lewis County, New York. The bird continued the assault for some time before it was dealt a fatal blow with a hammer.

These birds' bad habits incidentally turn them to good in the case of the English sparrow. In cold weather, when most native birds have gone south and the barnyard fowls are in winter quarters, the English sparrows furnish a constant supply of food. This trait, coupled with their insect-eating habits, shows us that there is some utility even among the most fierce and relentless of the feathered tribes.