AGRICULTURAL INVENTIONS.

Mr. Charles H. Roberts, of Poughkeepsie, N. Y., has patented some new and useful improvements in preserving forage, such as dry cornstalks, by storage in silos. The invention consists in moistening, wetting, or saturating the dry or partly dried stalks and plants—such as cornstalks—before or after they are placed in the silo, and they are then packed and compressed in the silo in this moistened state. In carrying out this invention, the dry or partially dried cornstalks from which the corn has been husked are cut into pieces of about three-eighths of an inch in length, or longer or shorter as may be desired; but the stalks should always be cut as finely as possible. In place of cutting the stalks, they may be mashed or broken by rollers or other suitable devices, or may be reduced to small pieces in any other suitable manner. These finely cut or reduced cornstalks are to be packed in a silo. Before or after cutting the stalks, or before or after being packed in the silo, these finely reduced cornstalks are sprinkled, moistened, wetted, or saturated with water or steam, or each layer is wetted or moistened in the silo. The cornstalks are packed and compressed in the silo in this wet or moistened state. It is desirable to get all the water into the stalks that they will absorb and retain after compression by the usual methods of compression of ensilage in silos. The object to be obtained by moistening or saturating the cornstalks with water is to restore to them about the amount of water the stalk, leaves, and husks have lost in maturing or by drying before or after being cut. The water absorbed by the cornstalks renders them soft and succulent, and adapted to be used as forage and packed in a silo. The results obtained with this forage have been highly satisfactory in every respect. This dry cornstalk forage can be stored in the same silo with the green ensilage, for the green corn (ensilage) is packed into the silo early in the season, and settles one-fourth to one-third of the entire depth. The dry cornstalks are taken from the fields after husking—that is, later in the season, and the silo is refilled with the forage prepared from the cornstalks after husking the corn.

An improvement in cotton planters has been patented by Messrs. Anthony W. Byers and James C. Dorser, of Sherman, Tex. The invention consists in the combination with the slotted hopper bottom of the hinged and curved cut-offs, whereby the escape of seed will be prevented, except as forced out by the prongs of the feed wheel.

An improved harrow evener has been patented by Mr. Hermann H. Fischer, of Osage, Neb. The invention consists in a harrow evener constructed of two triangular frames hinged to each other by a rod; and in the combination, with the harrow frame and the doubletree, of two triangular frames and their hinging rod, whereby either part of the harrow frame can be raised from its rear end or outer side to discharge collected rubbish without affecting the other part.

Messrs. John W. Jory and Arthur B. Jory, of Salem, Ore., have patented an improved grain header which will remove the heads of the grain and leave the whole of the stalks standing, however much the stalks may vary in length.

A novel milk cooler has been patented by Mr. Ellis F. Smith, of Polo, Ill. The invention consists in providing the side of the can with a chamber or tube, closed at the top, but open at the bottom, which tube or chamber is provided with an opening a little below the water line, the can being provided with an opening within the tube or chamber above the water line.

Mr. Abraham C Scarr, of Maryborough Township, Ontario, Canada, has patented an improved sulky harrow and seed sower combined, having such action that its teeth will not have a tendency to follow the edges of the furrows nor leave narrow unbroken ridges in the soil, but will cut the soil in all directions, causing complete pulverization of the soil and perfect covering of the seed without the necessity of cross-harrowing the field, and also to provide a harrow which cannot be easily clogged with sods or similar things, and in that manner prevented from free and perfect action and rendered hard of draught, as is the case with harrows of ordinary construction.

An improvement in nut locks has been patented by Messrs. James C. Beamer and John M. Richardson, of Carthage, Mo. The invention consists of two plates of strong sheet-iron wide enough to cover the fish bar, with each edge resting on the rail. Each plate is centrally slotted, and the edges of the slot are turned outward wide enough and long enough to stand out over both nuts in the end of a rail. These plates are connected at one end with a spiral spring, and their other ends are formed into hooks that go around and under the ends of the fish bar.

An improved corn planter and fertilizer distributer has been patented by Mr. William Cassill, of Hamden Junction, O. This is a simple and ingenious machine, contrived so that it will drop seed accurately and will distribute fertilizers evenly.

Railway Grades and Distances.

In an argument lately presented to the Advisory Commission of the trunk line railroads, touching the question of rates for freight traffic, Mr. E. H. Walker, statistician of the Produce Exchange, submitted some interesting and valuable figures relative to the grades upon our principal East and West railways. He finds that the distance from Chicago to New York by the Michigan Central, Canada Southern, and New York Central is 979 miles; by the Lake Shore and Michigan Southern and the Canada Southern 980 miles; by the Erie 974 miles, and by the Pennsylvania 912 miles. The distance from Chicago to Philadelphia by the Pennsylvania is 822 miles, and from Chicago to Baltimore by the Baltimore and Ohio is 840 miles, and by the Pennsylvania is 807 miles. The ascending grades on the Baltimore and Ohio going west from Baltimore are 231 miles, with an average ascent of 24 feet per mile, and the ascending grades going east from Wheeling, for 148 miles, average 30 feet to the mile. On account of a lack of data the gradients of the 461 miles between Wheeling and Chicago cannot be given, but Mr. Walker says it is not probable that they are less in crossing the States of Ohio, Indiana, and Illinois, about midway between the lakes and the Ohio River, than the roads passing near the level of the lakes—they are probably much more. Wheeling is 379 miles distant from Baltimore by the Baltimore and Ohio, and is 645 4-10 feet above the sea level. Wilson's Summit, 221 miles west of Baltimore, and 158 miles east of Wheeling, is 2,620 feet above the sea level.

By the Pennsylvania Railroad, Pittsburg is 354 miles from Philadelphia, and is 736 feet above tide-water. The summit of the Alleghanies, 2,154 feet above the sea level, is at Gallatzin, 250 miles west of Philadelphia, and 104 miles east of Pittsburg. Harrisburg, 105 miles west of Philadelphia, is 313 feet above the sea level. From Harrisburg to Philadelphia, for the distance of 105 miles, the gradients are irregular, and range from 5 feet to 43 feet to the mile. The gradients from Philadelphia to New York, 90 miles, are light nearly the entire distance, with none exceeding 26 feet to the mile. The grades from Spruce Creek, 215 miles west of Philadelphia, and 770 feet above the sea level, to Gallatzin, 250 miles west of Philadelphia and 40 miles from Spruce Creek, show a rise from 770 to 2,154 feet, being for 10 miles from 59 feet minimum to 95 feet maximum per mile. The gradients from Pittsburg to Chicago, 468 miles, probably considerably exceed those of the lines of road nearer Lake Erie.

By the Erie Railroad, the distance from Jersey City to Salamanca, 1,390 feet above the sea level, is 413 miles, and to Dunkirk, 582 feet above the sea level, is 456½ miles. The summit between Jersey City and Dunkirk is at Tip Top, 1,783 feet above sea level, and 345 miles west of Jersey City and 111½ miles east of Dunkirk. The gradients of this railway from Salamanca to Chicago will probably compare very favorably with either the Pennsylvania or the Baltimore and Ohio Railway. Port Jervis, 88 miles west of Jersey City, is 441 feet above tide level.

The gradients of the Central line are more favorable than either of the other roads. Those of the Hudson River division are very little more than those of the Hudson River itself. The greatest elevation going west on the New York Central is from 17 feet above tide level near Albany to 341 feet between Albany and Schenectady. Buffalo is 577 feet above the tide level. Batavia, 32½ miles from Buffalo, is 908 feet above tide level, which marks a rise in that distance of 331 feet, or about ten feet to the mile. From Batavia to Rochester there is a descending grade from 908 to 513 feet above tide level. From Rochester to Seneca River there are generally descending grades, from 513 above tide level at Rochester to 379 feet at Seneca River. From Seneca River to Syracuse there is a rising grade from 379 to 407 feet above tide. From Syracuse to Manlius there is a slightly rising grade from 407 to 413 feet above tide level. From Manlius to Wampsville there is a rising grade from 413 to 448 feet above tide level. From Wampsville to Green's Corners there is a rising grade from 448 to 488 feet above tide level. From Green's Corners to Rome there is a descending grade from 488 to 439 above tide level. There is a descending grade from Rome, 439 feet above tide, to 287 feet above tide at Schenectady. From Schenectady there is a rising grade in 11 miles from 287 to 315 feet above tide level, and then a descending grade for 11 miles to Albany 17 feet above tide level. The Canada Southern Railway is nearly as level as the waters of Lake Erie. There are no heavy grades on the Michigan Central or the Lake Shore and Michigan Southern roads. The level of the latter road nearly conforms to the level of the waters of Lake Erie. During the navigation season the trunk lines utilize the water transportation from Western lake ports to Buffalo, Erie, and Sandusky. Continuing, Mr. Walker says that railway engineer experts calculate that in operating a railway every foot of gradients makes an additional cost in the operating expenses, compared with the cost of operating a water level road, equal to an additional mile of level road. If this is so, the roads having the heavy grades are many miles longer than the New York Central or the Erie road. The distance from Chicago to Baltimore in lineal length is 134 to 140 miles less than to New York, and to Philadelphia is 152 to 158 miles less than to New York. The gradients of the Baltimore and Ohio and Pennsylvania roads are, however, many feet greater than the Erie or the New York Central—very much more than the difference in the length of the roads.

Fogs.

At a recent meeting of the Physical Society, London, Mr. Newth exhibited some interesting experiments illustrating the formation of fogs. In 1875, Mr. Marscart showed that mere reduction of temperature or pressure in the atmosphere might not give rise to fogs unless the air were pervaded by solid particles of smoke or certain gases, such as sulphurous acid gas, to form a nucleus for the water vapor to condense upon. This fact was ably demonstrated last year by Mr. Aitkin, of Falkirk, and Mr. Newth's experiments were designed to show it on the lecture table. For this purpose he had arranged a bulbous flask of glass connected to an air pump, and containing a little water in the bottom of the flask. The beam from an electric lamp could be thrown through the flask so as to illuminate the interior. Mr. Newth first admitted some of the mote-filled air of the room into the flask, and by partially exhausting it produced a thick fog; but on washing out the motes by agitating the water in the flask, the fog became far less appreciable. A small quantity of smoke introduced into the flask produced a thick fog; so also did the fumes from a piece of burning sulphur, and even a platinum wire rendered incandescent by an electric current gave off sufficient solid particles of dust or other matter to produce a fog. The inference is that even with gas grates and stoves we shall not get rid of fogs, though they be of a lighter color and less dense than with coal fires.

New Method of Wine-Making.

It is well known that the art of making wine according to the old method practiced over one thousand years ago, although for the most part still in vogue, is no longer adapted to the requirements of the present day. Owing to the various diseases to which the vine has of late become prey, grapes have increased considerably in value, so that it is of great importance to get the utmost out of them. By the old method, a very considerable quantity of valuable substances to which wine owes its aroma, body, and color, remains in the marc after musting.

Adolph Reihlen, of Stuttgart, has patented a simple and profitable process which opens a new era in wine industry, because it affords a means of thoroughly utilizing the grapes. An increase in the percentage absolute quantity of wine produced is attained, without, as in the case of Petiot's and Dr. Gall's method, affecting the quality of the wine.

Reihlen operates as follows: The berries are gently pressed, the must heated to boiling, and the marc mixed with the boiling must for three or four minutes, whereby the coloring matters, tartar, aroma, and other valuable substances, are extracted, and at the same time the injurious albuminous substances are rendered insoluble. The marc is, however, not quite exhausted by this process, but is capable of imparting the rest of its still valuable contents to weak wines, so-called fruit wines, and saccharine liquids generally. By Reihlen's method (which has been in operation since 1880), when purple grapes are worked up for wine, a deep bluish-red must is obtained in a few minutes without fermentation, the quantity of coloring matter extracted by the boiling must being from three to seven times as much as that extracted according to the old method after three months' fermentation. Reihlen further prepares the marc of purple grapes in such a way that even after years this will impart a color to red wines which have become bleached, or revive the taste of deteriorated wines.

What has been said about red wines applies equally to white wines, and the bouquet peculiar to the Riesling and Traminer grapes admits of being imparted to the must from other kinds of grapes Another peculiarity of Reihlen's process consists in using the carefully edulcorated grape-skins which are taken out while hot, drying them, and using them as a ferment. Reihlen states that grapeskins prepared in this way excite in must and in sweetened old and young wines, a fermentation of the sugar without any formation of yeast. The explanation of this apparent anomaly may be, perhaps, found in the theory that the ferment adheres very closely and persistently indeed to the skins, and the molecules of sugar being only brought in contact with it by means of the circulation of the liquid caused by the formation of alcohol and heat of fermentation. It then appears that the ferment is possessed of an extraordinary power of splitting up sugar. The result of these mutual combinations is, that the fermenting wine always appears clear.

Wine authorities are of one mind as to the value of Reihlen's discovery, and it seems likely that wine making according to this method will soon become universal. The Œnological Institute in Stuttgart is now testing the matter.—*Wiener Freie Presse.—Chem. and Drugg.*

Remarkable Example of Refraction.

Herr Hakonson-Hansen draws attention to a remarkable phenomenon due to refraction, observed by him at Trondhjem, on January 17, and similar in all respects to one witnessed by him at the same place on November 15, 1881. On both occasions, at 2:50 to 3 P.M. in the day, a rose-colored stripe was seen to stretch across the sky from about northwest to east. From the middle of this rose a vertical column of a somewhat lighter red color, and inclining on its western side to a shade of yellow, the whole being intensely luminous. After remaining visible for about ten minutes, the bright reds and yellows gradually faded away, leaving nothing but a blackish gray streak across the heavens. The sudden and striking apparition of this vertical column recalled, as Herr Hansen observes, the descriptions given in past ages of bloody crosses seen in the heavens, and regarded as prophetic of coming wars and pestilence, and he remarks that if it had been seen at a later period of the day, it might have been taken to be a specially brilliant aurora.

FLOUR PASTE.—Flour, four ounces; water, 1 pint; nitric acid, 40 minims; oil of cloves, 5 minims; carbolic acid, 5 minims. Thoroughly mix the flour and water, strain through a sieve, add the nitric acid, apply heat until thoroughly cooked, and, when nearly cold, add the oil of cloves and carbolic acid.