

The Solano—The Largest Ferryboat in the World.

The projection of this great ferryboat for the transportation of passengers and freight across the Straits of Carquinez, from Port Costa to Benicia, California, was noticed in this paper some months ago. Now that it is completed and afloat California may boast of the biggest ferryboat in the world. The dimensions of the Solano are:

Length over all, 424 feet; length on bottom—she has no keel—406 feet; height of sides in center, 18 feet 5 inches; height of sides at each end, from bottom of boat, 15 feet 10 inches; moulded beam, 64 feet; extreme width over guards, 116 feet; width of guards at center of boat, 25 feet 6 inches; reverse shear of deck, $2\frac{1}{2}$ feet. She has two vertical beam engines of 60 inch bore and 11 inch stroke, built at Wilmington, Del. The engines have a nominal horse power of 1,500 horses each, but are capable of being worked up to 2,000 horse power each. Upon the deck of the Solano are four tracks extending her entire length, with a capacity for carrying forty-eight loaded freight cars, or twenty-four passenger-coaches of the largest class. The rudders are worked by hydraulic steering gear, operated by an independent steam pump. These rudders are connected with the ordinary steering gear, so that in case of any disarrangement of the hydraulic apparatus the vessel may be guided by it. The advantage of this improvement is that the immense craft can be handled with ease by one man, whereas, if the ordinary wheel and system of steering were used, six men would be required at the wheel.

Lake Erie Vineyards.

The islands at the western end of Lake Erie and the neighboring shores of Sandusky Bay are largely devoted to the production of grapes and wine. The Sandusky Register's annual report, just published, for 1879, shows that there are in this district 4,000 acres planted with vines, the yield for the year being in round numbers 16,000,000 pounds of grapes. The wine houses report a production of 1,526,400 gallons. Of this by far the greater part is Catawba, which holds its own as the favorite American wine in spite of the efforts to popularize native red wines made from the Concord grape, the Ives seedling, and other varieties.

The Register estimates that not more than one million gallons of pure juice has gone with the million and a half gallons of wine. Some of the dealers, it says, make no secret of the fact that they use spirits, sugar, and water largely, and claim that this doctored stuff is more acceptable to their customers than pure wine.

NEW CAR STEP.

The annexed engraving shows an improved folding step applied to passenger cars to facilitate the ascent and descent of passengers from the platform, and to avoid climbing and jumping in getting on and off the cars. The folding step is connected with the lower car step, and when in position for use it is supported, when let down, by a yoke that passes under the fixed step.

The folding step comes within a foot of the ground, and permits of making the risers of all of the steps shorter, and the steps are of course much easier than the ordinary ones. When the train is ready to start the steps are turned up out of the way by means of a lever, which also holds them. In this position the steps cannot be injured or broken off by obstructions on the road or by snow or ice in the winter. Another important feature is that the step when folded up forms an effectual barrier against jumping on or off the train while it is in motion, and prevents a class of accidents that have been alarmingly frequent. Another advantage is that the step may be let down at one end of the car only, thus compelling passengers to enter at that end, and admitting of a more thorough scrutiny of the passengers and a complete inspection of the tickets.

This invention has been thoroughly tested, and the steps are now in use by the Delaware and Hudson Canal Company.

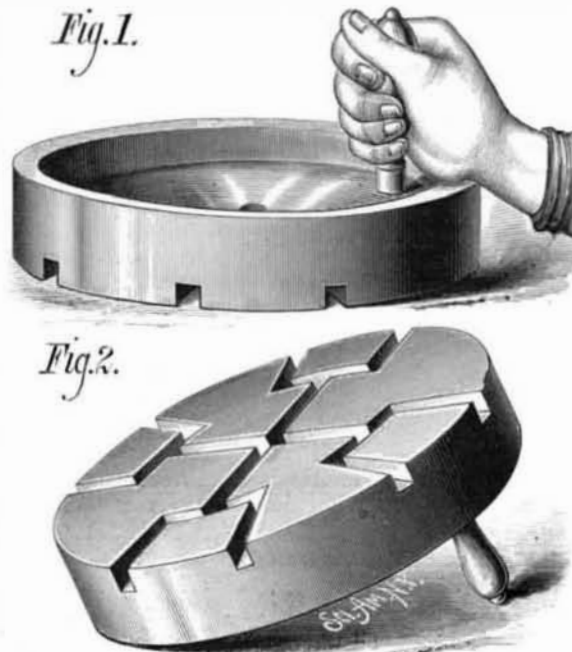
Further information may be obtained by addressing M. E. Skerritt, No. 4 High street Albany, N. Y.

Ballasting for Railways.

With reference to "Roadmaster's Difficulties," a correspondent writes that there is no material for ballasting so good as the screenings of coal from mines or yards, either alone or mixed with some hard stone.

NEW STONE-DRESSING TOOL.

The dressing-tool shown in the accompanying engraving was recently patented by Mr. Louis C. Gilmore, of Shearman, Texas. Fig. 1 represents the upper side, and Fig. 2 the under side of the tool, showing the radial and angled grooves. The tool consists of a circular plate having in its upper surface a cavity or basin communicating with the grooves in its under surface by a central aperture. A handle is fixed to the upper surface of the tool at one side of the center. When the tool is in use the cavity in its upper surface is filled with sand or emery and water, and it is moved

**GILMORE'S STONE-DRESSING TOOL.**

by the handle in an elliptical path, giving it a gyratory motion. This double motion of the tool greatly facilitates the operations of sand rubbing and polishing, and the grooves are of suitable form to distribute the abrasive material to the best advantage, and to retain it until it is used.

This tool is inexpensive, and may be used for the successive operations of sand rubbing, gritting or honing, and polishing.

Where the Cold Waves Come From.

Meteorological observations have now become so extended that evidence is rapidly accumulating to enable us to de-

termine positively the source of the cold aerial waves which sweep across our country during the winter season. The indications are that we owe them to the great area of high barometer in Northeastern Siberia, where the pressure sometimes exceeds 31.50 inches, and the temperature falls as low as 76° below zero. The pole of greatest cold is in the neighborhood of Yokutsk, on the Lena, where the average thermometric reading in January is 41° below zero, and where

the severest cold exceeds by ten degrees that experienced by explorers in high arctic regions. This is also the region of the highest barometric pressure known in winter; and from it, doubtless, proceed the waves of intense cold which play so large a part in our winter experiences.

The International Dairy Fair.

The second international dairy fair was opened in the American Institute building, December 8, with a fine display of dairy products, cattle, and machinery. The exhibits included butter, cheese, dairy cattle, implements and machinery for butter and cheese making, and agricultural designs and models for creameries, cheese factories, dairy buildings and farms.

In his opening address Mr. Francis B. Thurber gave the following facts and statistics collected by him during a recent visit to Europe:

The number of milch cows in Germany, as given by the latest statistics, is.....	8,961,221
In France.....	4,513,765
Great Britain and Ireland.....	3,706,766
Denmark.....	800,000
Sweden.....	1,356,576
Norway.....	741,574
Switzerland.....	592,463
While in the United States the latest statistics and estimates make the number of milch cows about.....	13,000,000

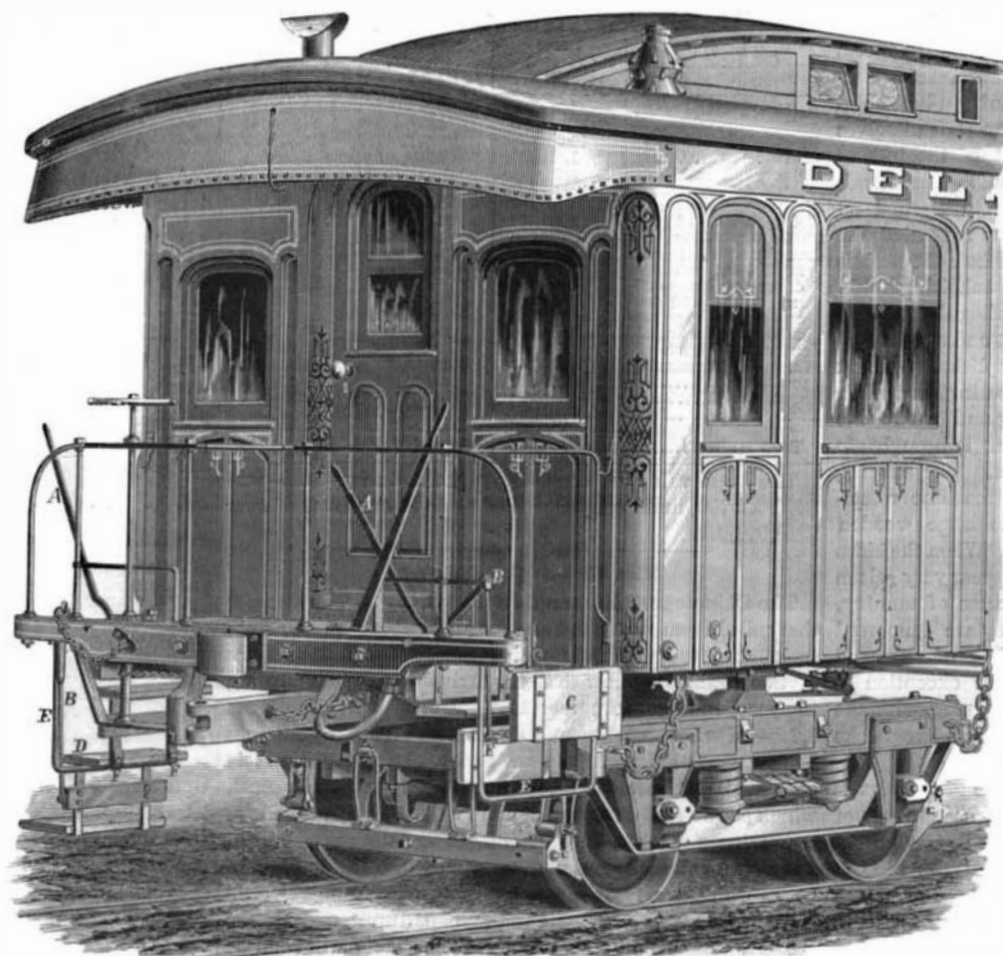
The quantity of butter and cheese per cow produced in the different countries varies so largely that no trustworthy average can be made, and the statistics, which embody only the quantities exported and imported, give but little idea of the total production. Some idea of the magnitude of the interest, however, may be formed from the fact that in this country alone, during the year 1878, three hundred and forty million pounds of cheese were produced, and nine hundred and sixty million pounds of butter. Of this but 3.9 per cent of the butter was exported, while of the cheese 41.6 was exported. Denmark, with but sixty million pounds total production of butter, exports thirty millions, or 50 per cent.

These export figures illustrate an important fact—namely that American dairymen have appreciated and catered to the tastes of cheese consumers in the great market of the world, Great Britain, while they have neglected to study the wants of the same consumers of butter. There is undoubtedly a difficulty in transporting butter long distances and delivering in perfect condition, but this is a difficulty which can be overcome, at least in a great degree. The great difficulty has been that so small a proportion of the immense production of butter in the United States has been of good quality, that really fine butter has commanded higher prices at home than abroad, and there is quite a sufficient quantity of poor butter to be found in most of the foreign markets.

Butter makers in other dairy countries have, however, made great progress in improving their product, and the average quality is much better than it was five, or even three years since. Improved dairy appliances and machinery, much of it of American origin, have been extensively introduced both on the Continent and in Great Britain; more attention has been paid to using the best salt; governmental dairyschools have been established in the continental dairy countries, even Russia having the enterprise to take this step, and scientifically educated dairymen are furnished by these schools to the principal dairy districts of their respective countries. Margarine butter, or oleo-margarine as it is called here, has also assisted in bringing about this result, as it competed successfully with the poorer grades of ordinary butter, and obliged European butter makers to make an effort to produce a superior article.

In Great Britain, the amount of intelligent effort which is being directed toward the improvement of dairy products, especially butter, is surprising, and if American butter-makers would enlarge their foreign market, they must in the same manner strive to increase the supply of good butter which is produced, and thereby lower prices to a point which will enable us to compete in the principal butter markets in the world. That we have the ability to do this no one can doubt who knows the progressive spirit of

the American people. Touching the scope for profitably enlarging the variety of cheese made in this country, Mr. Thurber remarked that a prominent English dairy authority has said that "cheese is made in the dairy," meaning thereby that almost any variety of cheese can be manufactured in countries other than those in which it originated. This has been proved by the successful manufacture in the United States and in France of the Gruyère, which, as we all know,

**IMPROVED CAR STEP.**

termine positively the source of the cold aerial waves which sweep across our country during the winter season. The indications are that we owe them to the great area of high barometer in Northeastern Siberia, where the pressure sometimes exceeds 31.50 inches, and the temperature falls as low as 76° below zero. The pole of greatest cold is in the neighborhood of Yokutsk, on the Lena, where the average thermometric reading in January is 41° below zero, and where