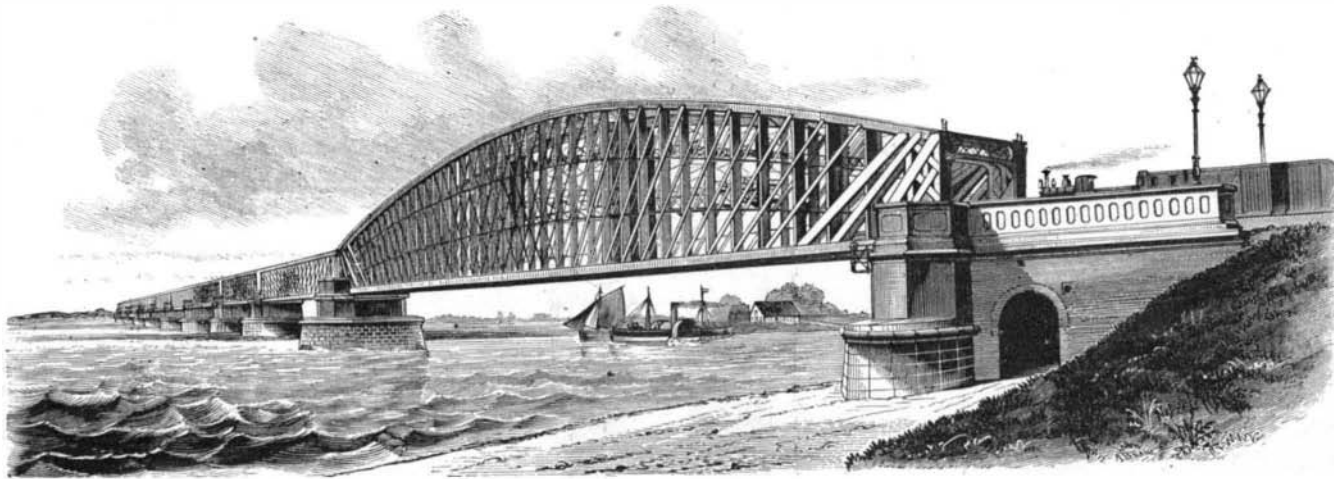


THE KUILENBURG BRIDGE.

The Utrecht Boxtel line of State railways in the Netherlands crosses three large rivers, the Lek, the Waal, and the Maas, within a distance of ten miles, the bridges at these points being known by the respective names of the Kuilenburg, the Bommel, and the Crèvecoeur viaducts. The great lengths of these bridges, the nature of the streams that they cross, and the local circumstances necessitated engineering skill of a high class. The conditions of the foundations were such as to require piling. The piles varied from twenty-three to fifty-three feet in length, being driven in some cases by the ordinary pile-driving engine, and in others by a steam ram. After the piles were cut off to a level below water, the space between them was filled with beton or concrete, projecting from three to five and a half feet beyond the footings of the masonry above, and varying from eleven to twenty-one feet in thickness. The tops of the piles were completely floored over, and masonry built up, well bonded on to the floors to prevent sliding by longitudinal and cross walings of oak, and the faces of piers and ice-breakers were finished in Belgian ashlar. The footings of the piers were thoroughly protected by a close row of long piles to each, and heavy rip-rapping of rough stone.

**BRIDGE AT KUILENBURG, DEPARTMENT OF THE NETHERLANDS.**

All holes for riveting were drilled, no punching being allowed in the work. The bridge is built for double track, there being only a single track placed on at present. Two footpaths are provided for the service of administration. The total weight of material in the structure is as follows:

| | |
|---------------------|---------------------------|
| Wrought iron..... | 4,394 $\frac{1}{2}$ tons. |
| Bessemer steel..... | 610 $\frac{1}{16}$ " |
| Cast iron..... | 30 " |
| Lead..... | 3 $\frac{1}{2}$ " |

There were also 8,000 cubic feet of oak, 9,500 cubic feet of timber used, and 350 tons of plates placed between them of fir to form the floor of the bridge. The total cost of the structure was upwards of \$1,187,100.

SAFETY APPLIANCE FOR RELEASING HORSES.

We give an engraving of a new safety device to be applied to the manger or some part of the stall to which horses are usually hitched. It consists in a device for cutting the halter should the horse become entangled in it.

Fig. 1 is a perspective view showing the exterior of the appliance, and Fig. 2 is a vertical section showing the arrangement of the several parts.

A hollow casting, A, is secured to the manger, and contains a spring-acted follower, C, which supports the halter and prevents it from coming into contact with the sharp edges of the casting, A, when no extraordinary strain is put upon the halter. The end of the halter is attached to a ring capable of sliding up and down on the rod, B. Should the horse become entangled so as to press down upon the halter, the follower in the casting, A, will be pressed down, allowing the halter to come into contact with the sharp edges of the casting and be instantly severed. It will be seen that so long as the halter fulfills its regular office it will not be cut, as the spring follower then holds it away from the cutting edges.

This invention was recently patented by Mr. Benjamin F. Strange, of Corvallis, Montana Ter.

SLED AND BOAT COMBINED.

The annexed engraving represents a novel gondola sled lately patented by Mr. James H. Dennis, of Newark, N. J. It is in reality a combined sleigh and boat, well adapted to both sleighing and boating purposes. Its construction will be readily understood from the engraving. The body or boat is similar in form to that of an ordinary row boat. It is provided with transverse seats, and may be made of sufficient size to contain several persons.

**DENNIS' GONDOLA SLED.**

The sled is propelled by a set of sweeps arranged in rowlocks and operated like oars. The sweeps are slotted to receive the pins of the rowlocks, and the ends of the sweeps are provided with serrated steel ends or claws which engage the surface of the ice as the sled is propelled. When the device is used as a boat these serrated ends may be removed and paddle blades attached in their stead.

At the rear of the boat there is a wheel used for steering the sled on the ice, and it answers equally well for a rudder for the boat when it floats in the water. A brake is attached to the rear to retard the motion of the sled; it may also be used to assist in steering.

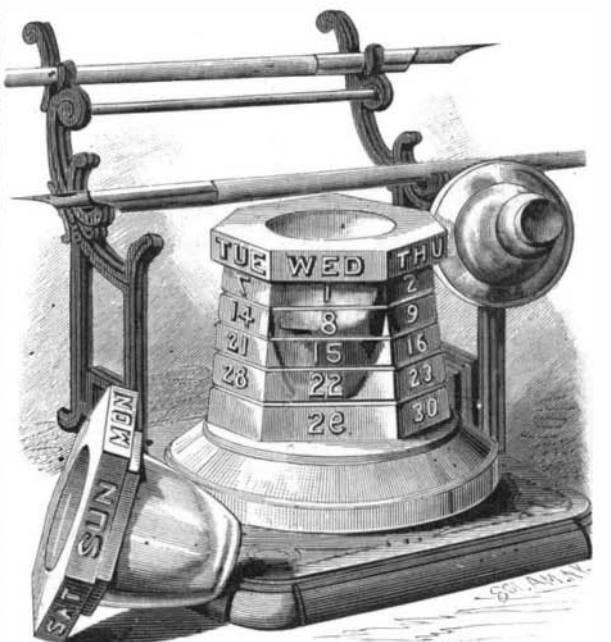
This gondola sled affords a means of

enjoyable winter exercise which may be participated in by a party of persons, and no very great exertion is required to get up an astonishing speed on smooth hard ice. The double character of the sled renders it perfectly safe even on thin ice, as it answers the purpose of a boat as well as of a sled.

Further information may be obtained by addressing Mr. James H. Dennis, care of O. B. Wilson, 22 Cedar street, New York city.

CALENDAR INKSTAND.

The engraving represents an inkstand provided with a

**PERPETUAL CALENDAR INKSTAND.**

calendar that requires changing but once a month to render it perpetual. It makes a handsome article of desk furniture, and as a calendar it is always in the right place. To change the adjustment is but the work of a moment; it is done by unscrewing a nut at the bottom of the stand, and

turning the ink fount around until the days of the week are directly over the spaces containing the figures representing the proper days of the month. For example, if Tuesday is the last day of September, then Wednesday being the first day of October, the ink fount is turned until Wednesday is over the column beginning with figure 1. This useful article may be made either wholly of glass or partly of glass and partly of metal or wholly of metal.

For further information, address Mr. S. M. Howard, administrator, 1207 Main street, Wheeling, W. Va., and see advertisement in another column.

THE result of the great English Derby race was cabled from London to New York in just twenty-five seconds. Tolerably quick work even for lightning.

West Indian Fruits.

I remember a few years ago I was one of a party-excursionizing down the Delaware. Our steamer passed an inward-bound schooner sailing up with a flooding tide, "wing and wing." The captain remarked, "There goes a fruiter," when everybody on deck rushed to the side to look at her. Doubtless, open-mouthed crowds, too, overlooked the unloading. How things have changed; here is one firm, Warner & Merritt, who keep twenty-six vessels busy bringing fruit to this port, three of them being steamers (and they talk of building more ships). So cargoes arrive almost daily.

Fruit is generally auctioned off at once upon arrival, if ripe; but if it needs maturing, it goes to the newly-finished warehouse nearly opposite, whose owners now have the satisfaction of having the finest building on the street, as well as the best appointed in the trade; a structure which has grown from small beginnings in so short a lapse of years, that the "trade" is just beginning to realize the fact of its existence.

Passing through the basement, or ground floor, by a devious path between barrels, boxes, and sacks full of oranges, nuts, dates, and what not, we went up to the offices on the second floor, as large and fine in appointments as those of a bank. Telephones to the top floor, to the wharves, to places all over town, to Cuba itself, possibly. A dozen clerks were busy with the multifarious details of the business.

Last week one of the firm was interviewed by a representative of one of the leading dailies with the following result:

"Now," he commenced, "is the opening of the active season. We expect a schooner to arrive on Monday from Jamaica with 6,500 bunches of bananas and 25,000 cocoanuts. In a few days a steamer will be due from Baracoa, Cuba, with 3,500 bunches of bananas and 50,000 cocoanuts."

"Are these bananas red or yellow?" was asked.

"The yellow bananas come from Jamaica and Aspinwall, and the red bananas from Cuba. The yellow bananas sell the best because they grow more to the bunch. A bunch of yellow bananas average about ten dozen, and sometimes they have as many as twenty dozen, while the red bananas seldom run over five dozen. The bunches are sold at about the same price, so the retailers can afford to sell the yellow ones for less and still make a better profit than they can on the red ones. So you see it is a difficult matter for us to sell red bananas when we have many of the yellow."

"Isn't the flavor of the yellow banana considered more delicate than that of the red?"

"By some people I believe it is. The flavor of a banana depends a great deal on the soil in which it is raised. Jamaica is the most favored in this respect; the bananas from Aspinwall are drier and not so rich. The Jamaica fruit is undoubtedly the best.

"We begin to receive pineapples from the Bahamas about the 1st of May, and the trade continues until the middle of July. In that time we receive over two millions of them. They are sold principally to canners and preservers. We shall send at least 300,000 to a canning establishment at Moorestown, N. J. Then the confectioners use a great many to make this candied fruit (glacé, I think they call it), and they consume more and more every year. Pineapples, in my opinion, make the nicest preserve there is."

"Is the demand good now?"

"Very good indeed," the importer went on. "When that shipment arrives we shall have to work a week night and day to get off the orders. We sell all quantities—fifty and a hundred bunch lots of bananas, case lots containing five bunches and even one bunch at a time. We send them all over the country. We very often make large shipments as far west as Missouri."

"Do you do much in California fruits?"

"Yes, in September we sell a good many California pears and grapes. We receive several car loads a week. The grapes, are, as a rule, very good, but I can't say as much for the pears."

"How is the consumption of dates and figs?"

"Very light. We don't sell many dried fruits, now that green fruits can be obtained at all seasons of the year."

"Is there any trade done in limes?"

"Yes, limes are imported later in the season. They are generally pickled or used for making punches. In Europe lime juice is made, and from that a very healthy drink, much preferable to lemonade. A good many are used in California, where they are sent from Mexico."

"May I trouble you to give me the rates fruits are selling for at present?"

"Certainly. Oranges bring from \$3.75 to \$4 per box; lemons from \$4 to \$5; bananas from \$2 to \$3.50 per bunch, according to size; limes from \$6 to \$10 a barrel of from 1,200 to 1,500; pineapples, this season, will wholesale at from \$10 to \$12 per hundred. These prices are about 25 per cent higher than those of last season, and the trade is active and steady. I never knew it to open better than it did this year."

Stepping upon an elevator, we passed upward by one floor after another, each of which held its share of stock, to the top story, where cocoanuts were being desiccated at the rate of 150,000 per month. First leaving the hands of men who chop away the shell with hatchets, and going into the insatiable jaws of a machine which "chaws up" 100 in a minute. Then the snowy flakes are treated to a littersugar and kiln dried, lastly being packed into shapely tincases bearing a label, "Gorton's Desiccated Coconut."

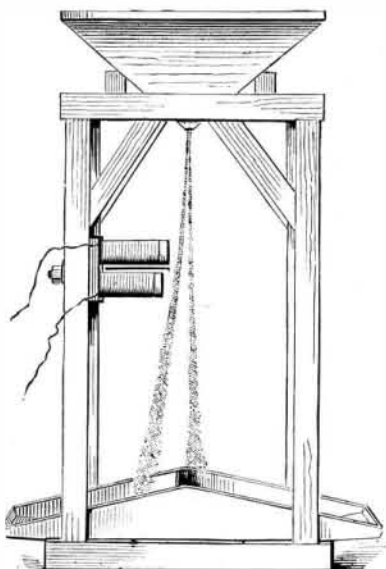
"We are working this department eighteen hours per

day," said our guide, "and must shortly put on an all-night force to keep up with our orders."

We looked into the refrigerating rooms—warm in winter and cool in summer—where bananas, thousands of bunches, are forced to maturity, or retarded, at will.

EDISON'S ORE SEPARATOR.

We give herewith an engraving illustrating the principle of Mr. Edison's recently patented magnetic ore separator. The device is intended for working tailings which are now thrown away as being too poor to pay for working by any

**EDISON'S MAGNETIC ORE SEPARATOR.**

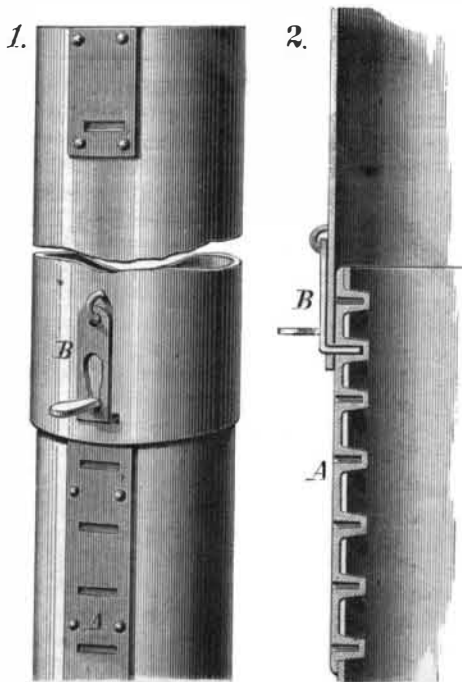
of the ordinary methods. The concentration is effected by allowing the sands to fall in front of the face of a large electro-magnet. The magnetic attraction changes the trajectory of the falling magnetic sand without stopping its fall, so that while the silicious sand, gold, and other non-magnetic substances fall straight down into one compartment of the receiving hopper, the trajectory of the magnetic sand is changed so that it falls into another compartment of the receiving hopper.

By this means the separation of the black sand is rapidly and completely effected with the expenditure of very little labor.

IMPROVEMENT IN STOVEPIPE.

We give herewith an engraving of an improvement in stovepipes, which will doubtless receive the approval of all who have had experience in joining and adjusting lengths of stovepipe. New pipe used in any place is scarcely ever right, and old pipe put in a new place is never right. The device shown in the engraving provides for lengthening and shortening the pipe and fastening it securely at any desired degree of extension.

The improvement consists in a cast metal plate, A, provided with a series of sockets, attached to a stovepipe length having a number of slots for receiving the sockets of the casting.

**FREEMAN'S EXTENSION STOVEPIPE.**

The sockets may be of any depth required to receive the tooth of a dog, B, hinged to the adjacent length of pipe. When the dog enters one of the sockets in the casting the two sections of pipe are firmly locked, and not liable to accidental separation.

This construction admits of any required change in the length of the pipe, and avoids all of the difficulties usually experienced in putting up stovepipe.

The inventor proposes to make the parts of either cast or stamped metal, or to stamp the recesses for receiving the dog, B, in the metal of which the pipe is formed.

Further information in relation to this useful invention may be obtained by addressing the inventor, Mr. W. C. Freeman, Fort Reno, Indian Territory.

Rules for the Management of Steam Boilers.

Engineers and users of steam power will be benefited by keeping in constant mind the following rules which the Hartford Steam Boiler Insurance Company keep posted in the boiler rooms where they have assured risks:

1. *Condition of the Water.*—The first duty of an engineer, when he enters his boiler room in the morning, is to ascertain how many gauges of water there are in his boilers. Never unbank nor replenish the fire until this is done. Accidents have occurred and many boilers have been entirely ruined from neglect of this precaution.

2. *Low Water.*—In case of low water, immediately cover the fire with ashes; or, if no ashes are at hand, use fresh coal. Do not turn on the feed under any circumstances, nor tamper with nor open the safety valve. Let the steam outlets remain as they are.

3. *In Case of Foaming.*—Close the throttle, and keep closed long enough to show true level of water. If that level is sufficiently high, feeding and blowing will usually suffice to correct the evil. In case of violent foamings, caused by dirty water, or change from salt to fresh, or *vice versa*, in addition to the action above stated, check draught and cover fires with fresh coal.

4. *Leaks.*—When leaks are discovered, they should be repaired as soon as possible.

5. *Blowing Off.*—Blow down, under a pressure not exceeding twenty pounds, at least once in two weeks; every Saturday night would be better. In case the feed becomes muddy, blow out six or eight inches every day. Where surface blow-cocks are used, they should be often opened for a few moments at a time.

6. *Filling up the Boiler.*—After blowing down, allow the boiler to become cool, before filling up again. Cold water pumped into hot boilers is very injurious, from sudden contraction.

7. *Exterior of Boiler.*—Care should be taken that no water comes in contact with the exterior of the boiler, either from leaky joints or other causes.

8. *Removing Deposit and Sediment.*—In tubular boilers the hand holes should be often opened, and all collections removed from over the fire. Also, when boilers are fed in in front, and blown off through the same pipe, the collection of mud or sediment in the rear end should be often removed.

9. *Safety Valves.*—Raise the safety valves cautiously and frequently, as they are liable to become fast in their seats and useless for the purpose intended.

10. *Safety Valve and Pressure Gauge.*—Should the gauge at any time indicate the limit of pressure allowed by this company, see that the safety valves are blowing off. In case of difference, notify the company's inspector.

11. *Gauge Cocks, Glass Gauges.*—Keep gauge cocks clear and in constant use. Glass gauges should not be relied on altogether.

12. *Blisters.*—When a blister appears there must be no delay in having it carefully examined and trimmed, or patched, as the case may require.

13. *Clean Sheets.*—Particular care should be taken to keep sheets and parts of boilers exposed to the fire perfectly clean; also, all tubes, flues, and connections well swept. This is particularly necessary where wood or soft coal is used as fuel.

14. *General Care of Boilers and Connections.*—Under all circumstances keep the gauges, cocks, etc., clean and in good order, and things generally in and about the engine and boiler room in a neat condition.

Ocean Icebergs.

During a recent passage of the steamer *Helvetia* from Antwerp to New York, the wind blowing a nice breeze from the westward, a sudden change in the temperature was noticed. An hour before the weather was quite sultry, awnings being spread fore and aft; but at about three o'clock in the afternoon, although the sun was shining brilliantly, a cold blast from the northwest set it. The rapidity of the change from a sweltering summer's day to an Arctic frost naturally caused considerable amazement, especially among the greener members of the crew. The more experienced knew what was coming, and when the cry of "Icebergs on the starboard bow!" followed immediately by the notification that others were visible on the port side, the mystery was explained. Then, right in the track of vessels were seen monstrous mountains of ice, some of them pure white, others crossed in many directions by broad stripes of blue. Some of them were 200 feet high and 1,000 feet long. There were at least thirty of them, extending for many miles.

The sea broke against them, forcing torrents of spray up the steep acclivities of their sides. The rays of the sun had melted the upper parts of many of them into the most fanciful shapes, and imaginary likenesses of crags, cliffs, and castles could be traced in those parts more exposed to the lines of the heat. Streams of water in picturesque cascades were flowing down into the sea, and the huge, majestic masses seemed to be moving slowly to the southeast. The *Helvetia* passed near enough to several of them to distinguish plainly the noise of the waves as they broke against the rugged sides of the bergs. As night closed in and the moon arose the sight was indeed beautiful.

The British steamer *Altmore*, from Liverpool, also encountered a number of icebergs, probably the same the *Helvetia* met with. Her commander, Captain Watson, describes one as being a mile long and 200 feet high.