Improved Sectional Tubular Steam Boiler.

Our engravings represent the Allen steam boiler, which many of our readers will recollect seeing at the late Fair of the American Institute, where it furnished steam to the Allen engine, an illustrated description of which appears on page 374, last volume of this journal. Two views are given, the first of which is a longitudinal section, and the second a half-cross section and half-front elevation. The boiler gave, on test at the Fair referred to, an evaporative capacity of ten pounds of water per pound of coal, under working pressure of from 60 to 80 pounds. When this economy of fuel is considered, in connection with the admitted safety of sectional boilers as a class, it will be acknowledged that the managers of the Institute acted wisely in engaging the same boiler to furnish steam for the exhibition of 1871.

The boiler was first exhibited at the Fair referred to, and was awarded the first premium. Its construction is such as obviates all strain due to unequal expansion, and a very large heating surface is obtained.

Perfect circulation is claimed to be obtained by inclining the tubes as shown in the longitudinal section. These tubes descend obliquely from larger tubes, in which the water line is shown in the half-cross section, and which in turn communicate with an ample steam dome, where the steam is super-heated, so that under ordinary circumstances, if any water be mechanically carried along by the steam to the dome, it is immediately converted into steam, and dry steam only can issue from the boiler. Provision is, however, made for preventing accumulation of water in the steam dome, through carelessness in carrying water too high, etc., by pipes leading from the ends of the steam dome down to the feed pipe.

The cold water descends along the under sides of the inclined tubes, and the steam rises along the upper sides.

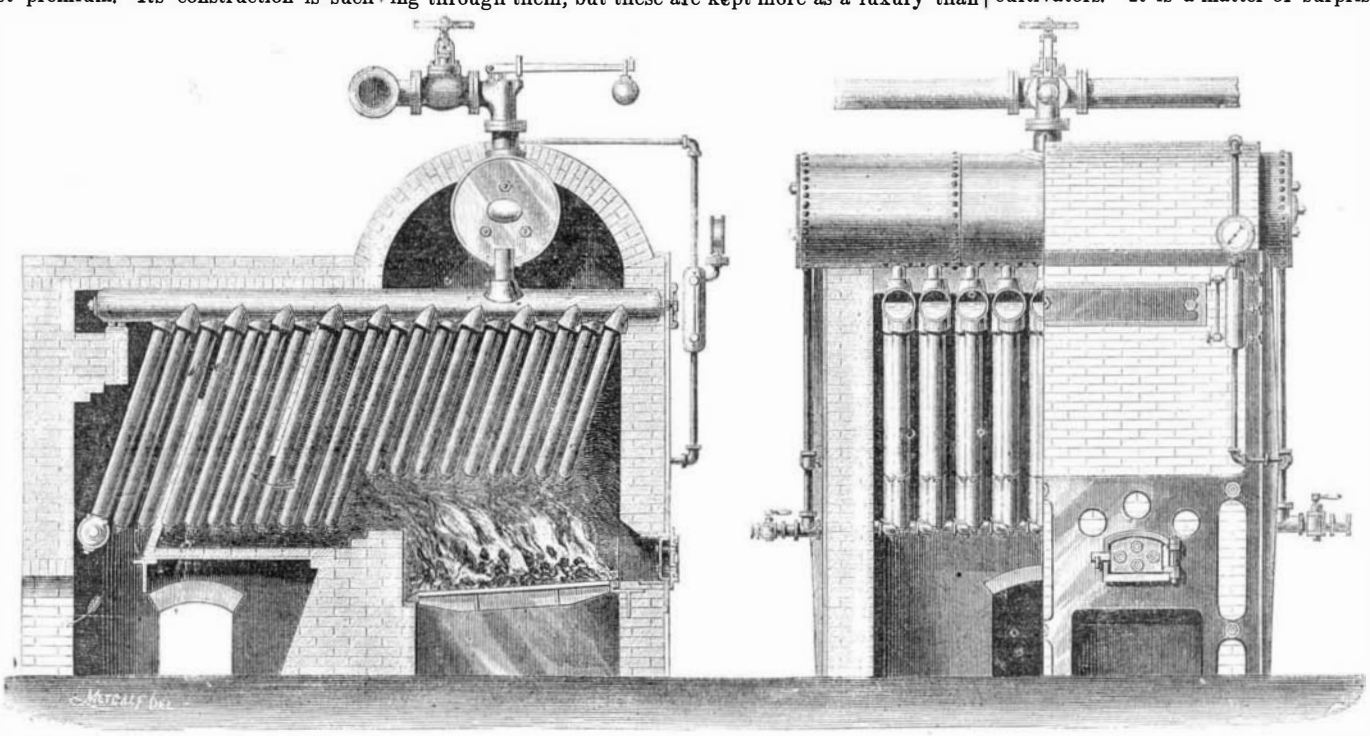
Both the outside and inside of every part of this boiler is perfectly accessible for cleaning, hand holes being formed at the lower ends of the inclined tubes, and at the front ends of the horizontal tubes. The gases have but a short distance to traverse, and ample space in passing between and around the tubes, so that a good draft is easily maintained.

The feed water is admitted at the lower end of the rear series of inclined tubes, and, coming first in contact with the cooler portions of the heated gases, passes along, as it becomes hotter, to the front tubes where the flame is the hottest. This construction enables the heat in the cooler portions of the gases to be utilized to the fullest extent.

The boiler can evidently compete in cost of construction with other sectional boilers, in market, and we have no doubt it will also be able to compete in economy.

The demand for safe boilers is daily increasing. Numerous disasters from explosions have caused people to consider whether an economy which renders steam boilers unsafe unless kept constantly under the supervision of careful experts, is not after all dearly purchased. To such as have decided this question in favor of safety, this boiler offers all they can desire on that score, while, at the same time, its evaporative power is quite equal to most of the boilers in market, whether sectional or otherwise.

For further information, address The Allen Engine Works, 4th avenue and 130th street, New York city.



THE ALLEN STEAM BOILER.

Telegraphic Possibilities.

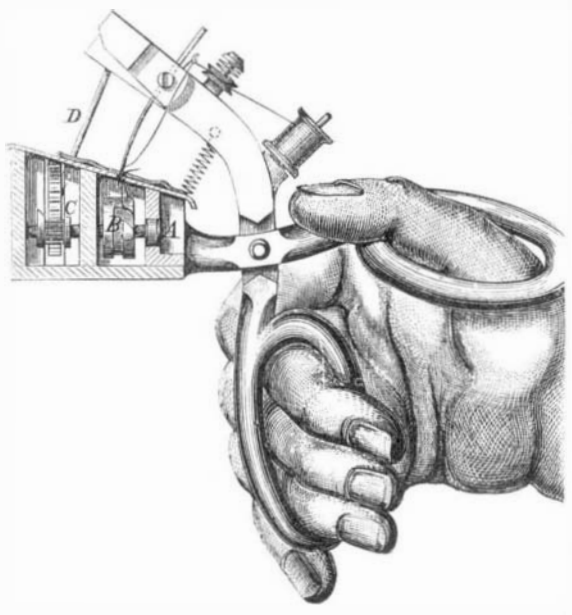
On the completion of the Russian-American telegraph line, a telegram from Alaska for New York, leaving Sitka, say at 6·40 on Monday morning, would be received at Nikolaief, Siberia, at six minutes past one on Tuesday morning; at St. Petersburg, Russia, at three minutes past six on Monday evening; at London, twenty-two minutes past four on Monday afternoon; and at New York, at forty-six minutes past six on Monday forenoon. Thus, allowing twenty minutes for each re-transmission, a message may start on the morning of one day, to be received and transmitted the next day, again received and transmitted on the afternoon of the day it starts, and finally reach its destination on the forenoon of the first day—the whole taking place in one hour.

Cheese Making.

It is absolutely necessary that means should exist in all dairies for preserving an equal temperature throughout the year; the cold of winter being hardly less injurious than the heat of summer. Care should also be taken to secure a plentiful supply of pure water, effective drainage, by which the water may be carried rapidly away, thorough ventilation, and facilities for the exercise of the most fastidious cleanliness. The building should, if possible, be built on the side of a gentle declivity facing the west, and sheltered from the north and east winds. In order to maintain an equal temperature, the walls should be of a considerable thickness, and built with a hollow space in them, through which a current of air may pass; the roof should also be of brick, of a curved or pavillion form, and the walls and roof may be plastered. The floor should be sunk about three feet under ground, made to slope to a drain (with bell trap) in the center, and paved with tiles or polished stone. On three sides of the dairy small arches should be turned about three feet high, carrying a shelf of slate or marble three feet wide, to hold the pans containing milk, and a little above this shelf, ventilating bricks should be placed with shutters sliding over them to open or shut, according to the weather. Several landed proprietors in Shropshire and Cheshire (England) have recently erected expensive and highly ornamental dairies on their estates, fitted up with massive marble tables and milk coolers, and with a constant stream of water passing through them, but these are kept more as a luxury than an object of profit, and they seldom unite all the conveniences essential to a good dairy, because the architects who plan them are seldom or never practical farmers.

HAND SEWING MACHINE.

A hand sewing machine, worked by the hand like shears, is, to say the least, a unique device. Our engraving shows such an implement. It is a lock-stitch machine. A is the bobbin; and B the hook or shuttle worked by the rack and pinion, C. The rack reciprocates in guides, and is impelled by the pitman, D. In use, the cloth is supported at one end by a sewing-bird or similar device, the other end being held tight



by the left hand. The machine is then grasped by the right hand, and worked along the seam, making one stitch for each reciprocating movement of the parts. This machine is the invention of B. W. Collier, of Oxford, Miss., who obtained a patent upon it in 1867.

The Uses of Salt.

The extent and importance of the uses of salt can scarcely be better described than in the words of Dr. Bolley, which we translate from his work, entitled "Das Kochsalz:" "We awake in the morning; the linen which we put on betrays by its whiteness that it has been bleached by the chlorine derived from salt; the shoes with which we cover our feet required salt in the hands of the tanner; in the soap that we use for the toilet, we seize a transformed piece of salt; the glass, which we bring to the mouth, hides the chief ingredient of salt; from the crude ore by means of salt, was produced the bright, white metal of the teaspoon, which is so highly esteemed by the world; the teakettle is soldered with borax which holds soda produced from salt; the milk before us contains salt; the butter has been preserved by salt perhaps for months; the bread betrays to the palate that the dough has been mixed with salt. We grasp the paper; it required the application of chlorine from salt in order to please us by its whiteness. The clean spectacles through which we see are partly composed of what once was salt. A visit is announced; a patient wishes to consult us; he enters, and, seeking scientific aid, we reflect upon the remedies at our command, and commence to write. Out of ten medicines we find that five of them owe their origin, either by their composition or the mode of their preparation, to salt. Who is able to forget for one moment this ever-present Proteus that appears in a thousand forms?"

Patent Cultivators.

Commissioner Capron, in his last report, remarks that little or no change has taken place in the manner of constructing cultivators. It is a matter of surprise, that out of the one hundred and fifty inventions patented, there should be scarcely one that for characteristic individuality merits especial mention. Inventors of this class of implements seem to be pretty well satisfied with the general construction already established, viz: a rectangular frame mounted on two wheels, and provided with a tongue and driver's seat, having swinging longitudinal beams, to which are rigidly attached standards bearing shovels or teeth, and they content themselves with improving the details. For this reason, most of the claims granted on cultivators (and patents on these machines generally embrace a long string of claims) are what are technically known as "combination claims," *i. e.*, claims on which the patentee disclaims the invention of the individual devices enumerated, but asserts that he is the first one to have brought them all together in the manner specified.

It is difficult to decide whether or not the tendency has been toward greater simplicity in cultivators. Some inventors seem to have aimed at that result and to have hit the mark, while others appear to have overlooked the idea, altogether. This remark is intended only with reference to a comparison of a few recent years, for certainly, when compared with similar inventions of twenty years ago, the complexity is all on the side of the more modern productions. Indeed, this is a safe general expression with regard to inventions of every character. The tendency of inventions at the present day is twofold, viz: to make each machine as nearly automatic as possible, and to combine in one structure the devices necessary for several purposes. These necessarily make machinery more cumbrous. It is not an exceptional thing to see combined with a cultivator, apparatus designed for several different purposes; as a breaking plow, a corn marker, a seed planter, a stock chopper, or a harrow.

In cultivators, considerable attention has been devoted to obtaining a ready and efficient expansibility and contraction of the beams, so as to admit of the adaptation of the same to the width of the rows cultivated. Successful attempts have been made to improve the shape of the teeth, that their cutting edges may act more efficiently, and to improve their adjustability, so as to throw the soil more or less to the right or left, all one way or the other, when in gangs, and to adjust their positions where more than one is used. Considerable intelligent labor has also been bestowed on constructing the teeth, so as to admit of their ready removal when worn out, or when, from any cause, it is desirable to detach them.

Several cultivators have been patented, especially devised for the culture of cotton and sugar, and which will be likely in view of the past want in those directions, to prove valuable, and consequently to go into general use.

As in the case of plows, the tendency is decidedly in favor of wheel cultivators.

METEOROLOGY IN IOWA.—The extreme dryness of last summer produced some very unusual phenomena in many parts of the United States, of which the meteorological appearances in Iowa may be specially mentioned. A correspondent, J. C. W., of Toronto, Iowa, describes the following; On March 16th, "a rare sight of sunbows;" September 24th, a magnificent aurora borealis; October 14th, "a fog sight," followed by another aurora; January 20th, a large meteor; and on February 5th, a snow storm, in which flakes of snow as large as snow birds fell in countless numbers.

TRUTH will ever be unpalatable to those who are determined not to relinquish error, but can never give offense to the honest and well meaning; for the plain-dealing remonstrances of a friend differ as widely from the rancor of an enemy, as the friendly probe of a physician from the dagger of an assassin.