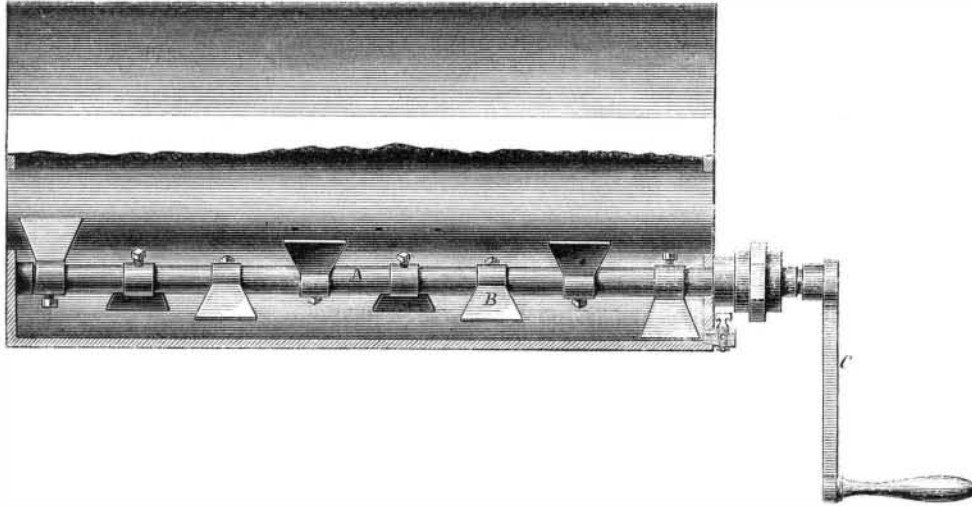


**Improved Boiler Scraper.**

It is well known that sediment deposited in steam boilers is very injurious and tends to destroy the iron in a short time. The engraving published herewith represents a plan for removing the scale by mechanical means. The mechanism is very simple being merely a shaft, A, run through a cylinder boiler within a few inches of the bottom. This shaft has a series of scrapers, B, upon it which nearly touch the lower sheets. The action of this arrangement is obvious. When the crank, C, is turned, any sediment which may have formed is disturbed or loosened, and mixed with the water, so that it can be readily blown out by the discharge or blow-cock. The action of the scrapers also creates a current in the contents of the boiler, so that the formation of scale is retarded, if not prevented entirely. The shaft may be turned several

**COOPER'S BOILER SCRAPER.**

times a day if the water is very foul, and it is claimed that this arrangement is a very efficient one. It was patented on May 3, 1864, by Henry D. Cooper; for further information address him at 34 Eldridge street, New York city.

**BI-MONTHLY REPORTS OF THE AGRICULTURAL DEPARTMENT.**

The new department of our Government, the Department of Agriculture, is exhibiting commendable enterprise. In addition to, or in place of, the annual reports which were issued in volumes too large to be read by most farmers, and which were circulated by the slow-moving Government printing establishment a full year after they were prepared, Commissioner Newton had decided to issue his reports in the form of small pamphlets once in two months, and we hope that means may be taken to have them printed without any very disgraceful delay. The principal reasons for the change are thus stated by the Commissioner in his bi-monthly report for March and April, the first of the series:—

“Although the annual volume issued by this Department has been published to the number of 130,000, and 60,000 additional copies have been ordered, yet a half million of them would be insufficient to meet the demand for them. Whilst this demand attests the approbation it has received, yet objections have long existed to the volumes that have preceded it from the Patent Office, on the ground that many topics discussed in them should have been earlier considered, and the facts embodied in them made public at an earlier period. Among the most prominent of like topics was such a collection of agricultural statistics as would serve to show the amount of each crop as soon as it was matured or harvested, that the price for it should be placed on the just law of supply; for if a commodity is scarce from the shortness of the crop, he whose labor has not met with its usual reward in quantity, from the vicissitudes of the season, should receive the compensation which the increased price gives, and not he who stands between the producer and consumer. Again, a question like that of the proposed tax on leaf tobacco, suddenly presented for consideration and action; or, like that of the manufacture of sorghum sugar and molasses, which the Department had considered through its chemist, and those engaged in it

should learn the results in time for their operations; or, like that presented in this report, of the direction the raising of stock is taking; or, like that of agricultural education, which a recent donation by Congress has invested with unexpected interest, by demanding immediate action upon it—all such subjects, to be effectively acted upon, need to be discussed immediately, and without that delay consequent upon the publication of an annual volume only.”

Other reasons for the change are also given at considerable length.

The first number contains 86 pages—more than half being devoted to minute meteorological observations. It seems to us that this information is interesting to the mass of people only when it has been reduced to general laws, and we presume that experience and reflection will lead to its omission from the

future reports of the Commissioner. They can be filled with far more interesting and valuable matter.

**THE SUBMARINE CABLES OF THE WORLD.**

From an official communication of the Gutta-percha Company, London, to Cyrus W. Field, Esq., it appears that 52 lines of submarine cable have been laid by English firms in different parts of the world, all of which are in successful operation with the exception of that between France and Algiers, and it is supposed that that was injured by lightning. The longest line in operation is that between Malta and Alexandria, 1,535 miles. The deepest water in which any working cable rests is 1,550 fathoms—1½ miles—between Toulon and Corsica. The aggregate length of working lines given in the table is 5,105 miles, and this does not include a number of short lines laid in different parts of the world, nor those laid by Felten & Guilleaume, of Cologne, amounting to more than 1,000 miles. One line has been laid 13 years, five have been laid 11 years, four 10 years, and others shorter periods.

**A Skillful Colored Mechanic.**

Prof. A. W. Smith, of the Naval School, Newport, R. I., exhibited at our office, a few days ago, a very ingeniously-constructed miniature steam engine and boiler of about 6-hp power, we should judge, which was designed and constructed by Benjamin Boardley—once a slave in Maryland. Attracted by the mechanical genius and skill of Boardley, a few gentlemen clubbed together and purchased him of his owner and gave him his liberty. He soon found employment in the Naval Academy, and under Prof. Smith he now has the sole charge of the philosophical apparatus of the institution.

**Joint-stock Companies in England.**

Since the passage of an act by the British Parliament, permitting the formation of joint-stock companies with only a limited liability on the part of the stockholders for the debts of the company, a large number of manufacturers have transferred their establishments to joint-stock companies. We suppose the original proprietors generally take a considerable portion of the stock and continue to manage the concern; their object in making the change being to obtain the use of a larger amount of capital.

**The Behring's Straits Telegraph.**

Mr. Perry M. Collins is the projector of this great enterprise. The Russian Government is constructing a line across the continent of Asia to the mouth of the Amoor river, and from this point to the mouth of the Columbia is about 6,500 miles. It is this gap which the company of Mr. Collins proposes to fill. What they ask of Congress is the right of way across the public lands, the grant of a square mile of land at each station; the stations being 15 miles apart—and the payment of \$50,000 a year for the Government use of the telegraph.

**CHEAP TELEGRAPHING.**—A new telegraph company has commenced sending messages between Liverpool and Manchester, England, at 12 cents each, and it proposes to adopt this low charge for messages between any two places, without regard to distance, as its lines are extended. The telegraph companies having lines between our principal cities make enormous profits, and it only needs the efforts of some public-spirited capitalists to bring down the charges to a fraction of the present rates.

THE

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