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NEW SERIES.

IMPROVED STEAM BOILER.

The great practical problem of the present day is the most economical and efficient mode of generating and using steam. The form and construction of the boilers are constant objects of experiment, and a vast amount of study has been expended upon the best mode of setting them. W. D. Ballard, of Kansas City, Mo., has conceived a plan, here illustrated, which he regards as better than any other.

The boiler, A, supported by piers at its ends, and, if necessary, by intermediate piers, is completely surrounded at a moderate distance, on all sides and overhead, by a tight brick wall. B represents the fireplace, C the ash-pit, and D a mud boiler which communicates with the main boiler by the pipe, *d*. The boiler has two flues, and a brick partition is constructed entirely around the boiler, extending from its outer surface to the surrounding wall above the level of the flues on one side, and below their level on the other, passing by a vertical angle, between the mouths of the flues at each end. The opening into the chimney is above the boiler. As the gaseous products of combustion rise from the fire-place, B, they pass to the right and left towards both ends of the boiler; those which pass to the right entering the flue, *h*, and, going through the boiler to the farther end, flow up over the boiler and enter the chimney at F; while those which pass to the left enter the other flue, and, going through the boiler in the opposite direction, also flow over and enter the chimney at the same place.

The patent for this plan of setting a boiler was granted on October 20, 1859. The claim may be found on another page. Inquiries for further information in relation to it may be addressed to him as above.

RUSSIA LEATHER.

It is known that much excellent leather, of every kind, is prepared in different parts of the Russian empire, and that, though numberless efforts have been made by manufacturers in other countries to imitate, in all respects, the genuine Russia article, such efforts have unvaryingly failed. The preparation, therefore, of fine Russia leather, so well known for its quality and for its peculiar smell, is a process which continues to remain exclusively with the artisans of that country. The hides are first put into a weak alkaline ley to loosen the hair, and then scraped on a beam; then, if calves', are reduced by dogs' excrement a sour oatmeal drench, and tanned with great care and frequent handling. The bark used is that of the willow, sometimes mixed with that of the birch tree. The skins are generally dyed red and black; the former color is given with alum and Brazil wood; black is dyed with the acetate of iron and logwood. Birch bark oil is generally applied as a dressing; and its smell is much prized, as it prevents the attack of insects when the leather is used for book-binding. The streaked or barred surface is given to the leather by a very heavy steel cylinder wound round with wires. It is remarkable that, for making a peculiar kind of leather, as well as sheet-iron, Russia surpasses all the rest of the world.

FAWKES' STEAM PLOW

Some time ago Mr. Fawkes was engaged by the managers of the American Institute to give an exhibition of his steam plow during the fair, and we expected this would have been both an instructive and attractive public *fete*. In this expectation we have been greatly disappointed. It was originally intimated that a favorable and an extensive piece of land near Harlem had been engaged for the display, but as the Third-avenue Railroad Company had fenced in a small plot of ground at Hamilton Park for the cattle-show, the managers of the institute, under a most perverse judgment, selected this field for the trial of the plow. There was not a rod of this ground fit for the experiment; it was filled with large rocks lying near the surface, and was not over an acre in extent. The consequence was, that during the several trials given on three days last week, the plow had to be stopped every few seconds on account of these rocks, and it was actually impossible to show what it could do. Those who went to see the plowing-match were

ference of the drum. There is a small donkey-engine connected with the boiler, which answers for a feed pump, and also for a steam fire-pump, if desired. The face of the drum has adjustable spuds on it to give it adhesion on the ground, and the plows are connected by chains on a long angular beam, and set one behind the other. They are raised up and let down by devices actuating small windlasses, for winding up the chains, and all is under the control of the engineer standing at the steering-wheel in front.

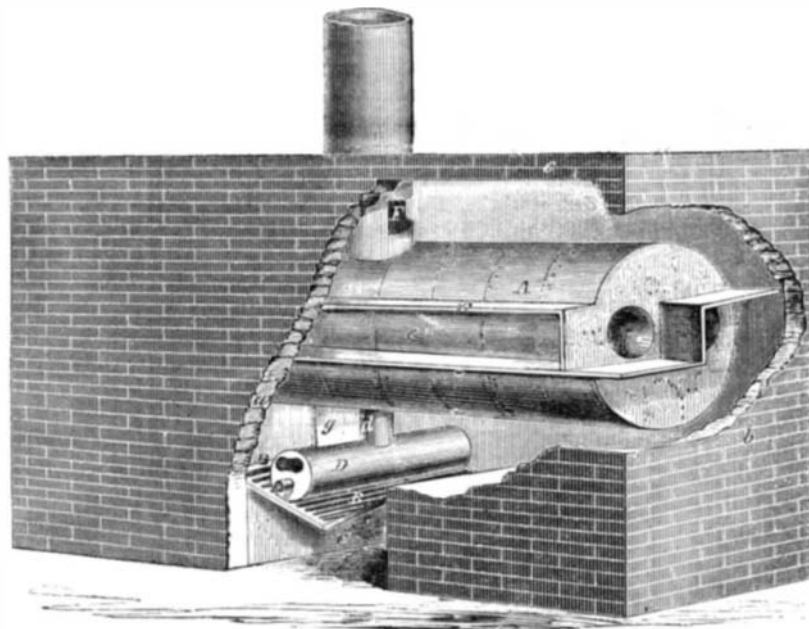
It is to be regretted that the ground was so unfavorable; had it been otherwise, the exhibition would have been an entire success.

An engraving and description of this celebrated plow was published in No. 11 of the present volume of the SCIENTIFIC AMERICAN.

SIR JOHN FRANKLIN'S REMAINS.

The expedition fitted out two years ago, under Capt. Robert McClintock, at the expense of Lady Franklin, to search for her husband in the Arctic regions, have returned with full and correct tidings of the sad fate of Franklin and his companions. Captain McClintock found the record and remains of Franklin at Point Victory; and it seems that he died in June, 1847—about 11 years ago. The whole of his companions also perished, some at one place and some at another, in those inhospitable and desolate regions. We hope the last expedition to these dread solitudes of ice and snow has been made. A north-west passage was discovered by Captain McClure; but of what value is it? For the purposes of navigation, it is perfectly impracticable; and the conclusion is, that the life and treasure which have been expended in Arctic expeditions have been wasted in the pursuit of an impracticable object. No less than 120 persons perished with Franklin; and five separate expeditions have been fitted out to search for the lost explorers; one

BALLARD'S IMPROVED STEAM-BOILER.



disgusted with the arrangements, and declared that they could not have been better planned to defeat the very objects for which the steam plow had been engaged. On Thursday afternoon, while we were witnessing the display, the ease with which the plow was managed to move in any direction, back and forth, and to turn in a very small space, elicited the admiration of all the spectators. It dragged eight plows; and had there been no rocks to obstruct their progress, it could have plowed more than one acre in an hour with the utmost ease. This steam plow weighs seven tons, and resembles a locomotive with an upright boiler, resting upon a single huge wheel or drum, six feet in diameter and of a like breadth. It has two small trailing-wheels in front of the boiler, which form the steering-gear to turn it in any direction. They turn on a swivel plate and are operated by a circular rack-gearing and a screw-shaft. There are two cylinders, one at each side, each nine inches in diameter and 15 inches stroke. The piston-rods are connected by gears and pinions to the shaft of the large drum, which is really the "driving-wheel." The motion of the piston is reduced by the gearing, owing to the great circum-

of these, on one occasion, was within a few miles of some of the survivors, according to the records which have been found.

NEW WATER HOSE.—We have lately examined a new water tubing manufactured by James Boyd & Sons, of Boston, which promises to be a cheap and very suitable substitute for the hose now made from other materials. It is composed of a strong cotton webbing, not woven in tube form, like the Grenoble hempen hose, but in a plain loom, then lined with india-rubber and riveted like leather hose. It has been successfully tested under a pressure of 170 pounds to the square inch, and appears well adapted for all purposes to which flexible water-hose is now applied.

ALABAMA COTTON.—A correspondent, writing to us from Alabama, states that the cotton fields are white for the picking-season, but that they have been considerably injured by rains and winds. During the year ending the first of this month, we sent 2,019,252 bales of cotton to England.