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Improved Boiler Feeder.

This feeder presents some new features which seem to commend it to the attention of engineers. It is claimed to effectually prevent the collection and deposition of sediment in the boiler from impure water. The California Steam Navigation Company has run boats three thousand miles with tubular boilers, using this heater, without cleaning boilers, although the water contained as much mud as that of the Missouri river.

The case, A, Fig. 1, is of sheet iron or other suitable material, cylindrical, or in any other convenient form, closed at the ends by the heads, B and C, and having, at a short distance from the ends, transverse partitions, which support the ends of the tubes, D. The water to be heated enters the shell by the pipe, E, and passes through the tubes, entering the boiler by the pipe, F. The exhaust steam enters at G and leaves at H. The pipe, I, discharges the condensed steam in the form of water. The head, C, is provided with a chamber, J, from the inner plate of which small tubes, or nozzles, K, project into the water tubes D. The sediment which may gather in the water tubes is blown out and through the pipe, L, by steam admitted at will through the pipe, M, from the boiler. The steam and water from the boiler being discharged through the nozzles, K, into the tubes, D, effectually washes them, thus preventing the collection of sediment in the boiler.

It will be seen that the exhaust steam traverses the length of the heater surrounding the water tubes, and thoroughly heats the water before its admission to the boiler. The gradual circulation of the water through the cluster of pipes favors the deposition of the sediment mechanically suspended in it, which can be readily removed by injecting the steam from the boiler through the pipe, M, and the nozzles, K.

This improvement was patented through the Scientific American Patent Agency Oct. 17, 1865, by William B. Cross, of Sacramento, Cal., who will furnish all necessary information.

An Iron Mountain in Sweden.

From the London *Mining Journal* we learn that a company, formed in England for the development of Swedish iron mines, from failure to pay their men, have stopped their works. A meeting of the stockholders has been held in London and it is hoped something will be done to start the undertaking on a firm basis. It was reported at that meeting that the company own a "mountain of iron," containing, by assay, seventy-two per cent of pure metallic iron. The principal drawback to the realization of the wealth of the region is its locality and the climate; a long road over a vast plain being necessary, and the long winters disheartening the laborers. The

construction of an easily-traveled road, it was thought, would, by frequent communication, be an inducement to the employes to make permanent engagements.

The Palliser Gun.

Last August four Palliser guns were tested with perfect success at the proof butt in the Royal Arsenal at Woolwich, under the superintendence of Lieutenant Colonel Freeth, Assistant Superintendent of

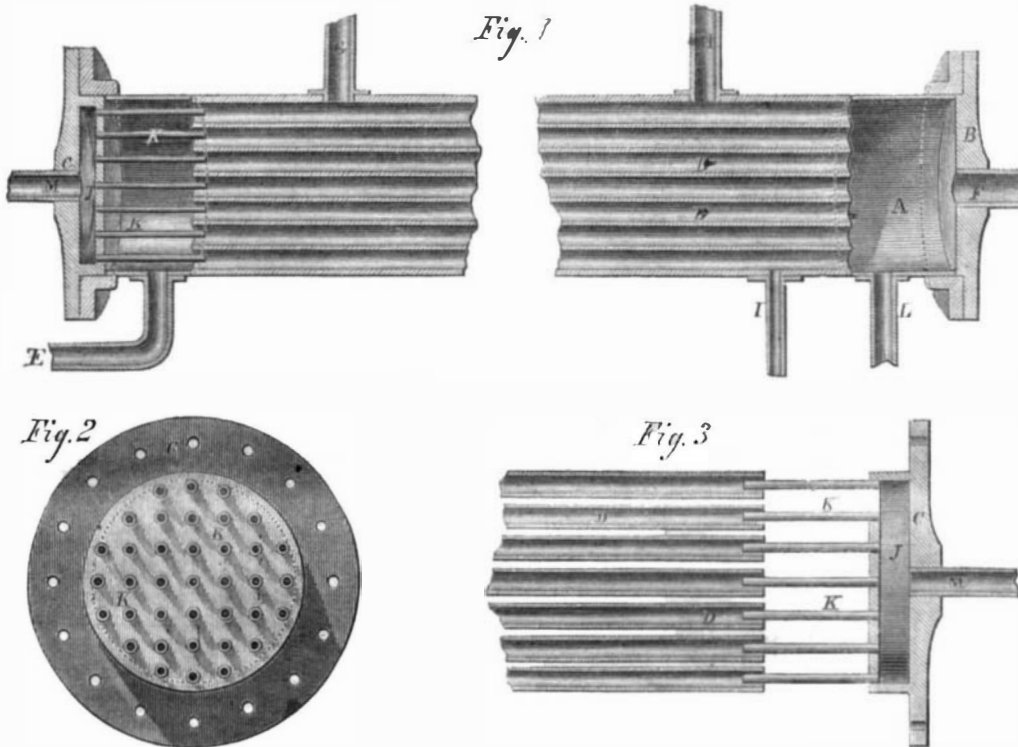
shot. To the astonishment of every one present the gun had not sustained the slightest injury. It was therefore decided by the Ordnance Select Committee to put the gun through a supplementary trial to ascertain its maximum or highest power of endurance, when it will have to fire 20-lb. to 25-lb. and 30-lb. charges, with cylinders of 150 lbs. weight. Major Palliser has expressed great confidence in the strength of the gun, and states that he has no fear of the result of any reasonable amount of proof, even

beyond what is absolutely necessary. The trial, it is admitted, has already borne out the anticipations of the inventor and manufacturers, and has fully justified the recommendation of the Ordnance Select Committee and their introduction of these guns for the consideration of the War Department to use up the heavy stock of guns on hand. On account of their weight, their service charges will be only 6 lbs. or 8 lbs. of powder. Sufficient evidence, it is stated, has already been obtained to prove that we have thus a most efficient and reliable addition to our stock of rifled ordnance—a fact which, in the present difficulties with which the Government is embarrassed for want of serviceable guns, will be hailed with much satisfaction, more especially as the two new guns now pronounced successful—those of Major Palliser and Mr. Frazer—will be produced at a cost far below that of the present guns, in which the country have long since ceased to have any confidence.—*Mechanics' Magazine.*

Manufactures as a Means of Wealth.

The manufactures and commerce of England have made her the richest country on the globe. Her commerce is a consequence of her manufactures, which have also swollen the value of farming lands to a proportion unsurpassed by those of any other nation. New England, with a sterile soil and unfavorable climate, although boasting some of the finest farms in the country, owes her remarkable prosperity to her manufactures and the trade and commerce which they foster and sustain. The Middle States also sustain their importance by this source of wealth, rather than by their agricultural productions. But this interest is vastly improved in value by the establishment of manufactories. It is estimated that when the agricultural capital of England was £3,311,000,000 and the investment in manufactures £218,000,000, the profits on the former were only 13 per cent while the latter produced 120 per cent. In her manufactures, therefore, must we look for the main source of England's wealth.

The total value of prizes to be given at the Paris Exhibition is \$190,000 in gold. In the department of arts there are seventeen grand prizes valued at \$400 each; thirty-two first prizes valued at \$160 each; forty-four second prizes, \$100 each; and forty six third prizes, \$80 each.



CROSS'S BOILER FEEDER.

the Royal Gun Factories. These guns were formerly cast-iron 32-pounders and 24-pounders, and have been converted into 64-pounders and 56-pounders, at Elswick. Twenty more of these guns arrived the same day at Woolwich, and will at once be sent to proof. A 64-pounder Palliser gun has also undergone a most severe test of endurance. This was a 32 pounder, weighing only 58 cwt. According to the *Times*, the test was as follows:—Two rounds, with charges of 16 lbs. of powder and 150-lb. cylinders; 10 rounds, with charges of 20 lbs. of powder and 100-lb. cylinders; and, finally, 10 rounds, with 16 lbs. of powder and 64 lbs. shells. The shells were loaded with their fuse holes toward the powder, and, as the fuses had been taken out, the flash of the discharge set fire to the powder in the shells and burst them in the gun. It was generally expected that this test would have burst the gun, or, at all events, that it would have blown off the muzzle or otherwise have rendered it unserviceable; but beyond the one fact of the bore being scratched by the splinter of the shells no injury was perceptible, and the gun was loaded with the same facility and fired as before. It appeared from a subsequent examination that some of the shells had burst before they had moved, and that others had burst close to the muzzle of the gun. A number of 64-lb. shot were then fired with 16-lb. charges, but, instead of the shot being rammed home, they were only pushed down to certain positions in the gun, so as to leave vacant spaces of 5 inches, 10 inches, 15 inches, 20 inches, and 25 inches between the powder and the