IMPROVEMENT IN STEAM BOILER FURNACES.

The engravings show what the inventor calls a rational construction for generating steam. And the reason why it is called a rational construction is because it utilizes heat that is wasted and lost in all other forms of steam boilers set in brick.

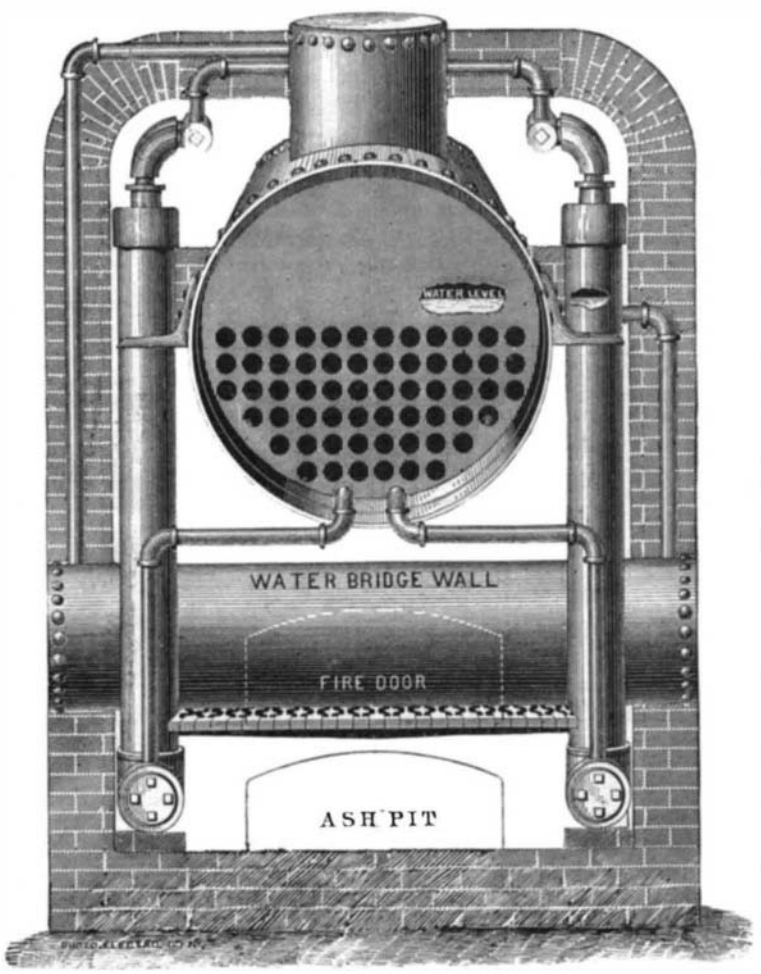
On the side walls of an ordinary boiler set in brick, and on the side of the grate bars. there are some sixty square feet of surface, that absorb fifty per cent of the heat of the fuel.

If the users of steam boilers, as usually set, realized the full value of their fuel, they would, in most cases, be able to evaporate at least fourteen pounds of water to each pound of coal consumed; whereas, with imperfect construction and setting, it is a rare thing to find them that evaporate (allowing for dry steam) over seven pounds of water for each pound of fuel. To overcome this deficiency in the imperfect setting of steam boilers, Mr. Charles D. Smith—who is connected with the house of Edward Barr, 78 John street, New York city—has invented and constructed a furnace that has been applied to a large number of boilers, both new and old, and, as we have been informed by parties using it, with great success. At the brewery of Anton Hupfels, 38th street and Third avenue, they formerly used two horizontal tubular boilers, 54 inches diameter by 16 feet long. To one of these boilers, one of these furnaces was attached three and a half years ago, since which time this boiler and furnace have done the work that formerly required both boilers, notwithstanding an increase of business. This increase in efficiency was secured without expense to boiler or furnace, and effected a saving of fuel.

We are informed that three years ago two boilers, with furnaces attached, were placed at Lord & Taylor's, corner of 20th street and Broadway. The chief engineer, Mr. Scott, who has been in charge there for eleven years, tells all who inquire that he effects a saving of 28 per cent in fuel alone.

The improvement has also been applied in the brewery of Donald Smith, on 18th street and Eighth avenue, with the same results.

We are informed that the improvement has been adopted by the following large corporations: Cambria Iron and Steel Works, Johnstown, Pa.; Merchant's Mills, of Fall River, Mass.; Manhattan Silver Mining Company, of Austin, Nev.; George Ehret, brewer, New York, who, after using it for three years, applied it to all his boilers. Many others have adopted it.



END VIEW OF BOILER WITH SMITH'S IMPROVED FURNACE.

The columns on the sides take the place of the wall of fire brick each side of the grate bars. They are made of five-inch pipe, and will stand a cold water pressure of 2,000 pounds to the square inch. The round bridge wall is made of steel plate. It is 14 inches in diameter, and takes the place of the brick bridge wall. The pipes from the bridge back are 2½ inches in diameter, and in an ordinary boiler add about 200 feet to the fire surface. The fire surface required is but 4 square feet to a horse-power; in heating surface, as generally estimated, 12 to 15 square feet are required.

The larger engraving is a side elevation of the boiler with parts of the arch, boiler, and tubes broken away to show interior construction. The smaller engraving shows the boiler and arch with the front removed.

The judges' report of the test of steam boilers at the Centennial Exhibition, in Philadelphia 1876, shows that the application of these water walls to a horizontal tubular boiler gave a higher evaporation by over 12 per cent, with an increased capacity of 74 per cent over any other boiler competing in the test, showing that the fuel generally wasted amounts to 65 per cent of the amount used.

Further information as to construction, operation, etc., may be obtained by addressing Mr. Edward Barr, dealer in iron pipe and steam supplies, and sole manufacturer of Smith's furnace, 78 John street, New York city.

The Electric Light for Deep Water Investigations.

Some interesting experiments have been made at Baltimore to test the applicability of the electric light for deep water investigations, the aim being to illuminate brilliantly the water and the bottom to depths of two hundred feet or more. The tests were made with a Brush apparatus operated by an eight horse power engine, mounted upon a scow and towed about the harbor by a tug boat. The results obtained were not fully satisfactory, owing principally to the roughness of the water, but the trial was a most interesting one, and the power of the electric light was strikingly manifested.

A movable parabolical reflector was used back of the light, which was again and again thrown against vessels from two to two and a half miles distant, bringing them out in clear, full view, and enabling their names to be read with the aid of a glass. When the light was thrown upon the dome of the City Hall, it leaped out of the darkness and stood up against the dark sky as if suspended in mid-air. One of the curious features of this part of the display was that to persons in the city the shadows of steamers and other vessels, passing between the light and the City Hall dome, were distinctly portrayed against the white background.

The Telephone in Hungary.

Mr. D. H. Washburn, who has been engaged for some months introducing the telephone into Buda-Pesth, Hungary, reports very encouraging success. He writes that the director of the company, Mr. Francis Puskäs, had obtained the exclusive right to use the telephone in Hungary, and that connections were being made between Buda-Pesth and the adjacent towns. The charge for the service is 15 guilders—about $6—a month. The Edison transmitter is used with magnetic call. Supplies are got mainly from New York.

Mr. Washburn finds the Hungarians very backward in the adoption of modern improvements. A good mechanic in Buda-Pest gets from $6 to $10 a week, and does as much work as an American, with improved tools, could do in an afternoon. The cost of living is reasonable, a good dinner with wine costing about 75 cents. The beef is poor, and the pork dear, a guilder (41 cents) a pound. Vegetables are good and cheap. Rents are not high.

As an indication of the inconveniences of a paternal government Mr. Washburn mentions the fact that before a man can subscribe to the telephone exchange his name and business have to be sent to four different government offices for permission. The telephone company has to report to the authorities what everything costs and what every employe receives. "In fact," adds Mr. Washburn, "every one that lives here is but a slave of the government."

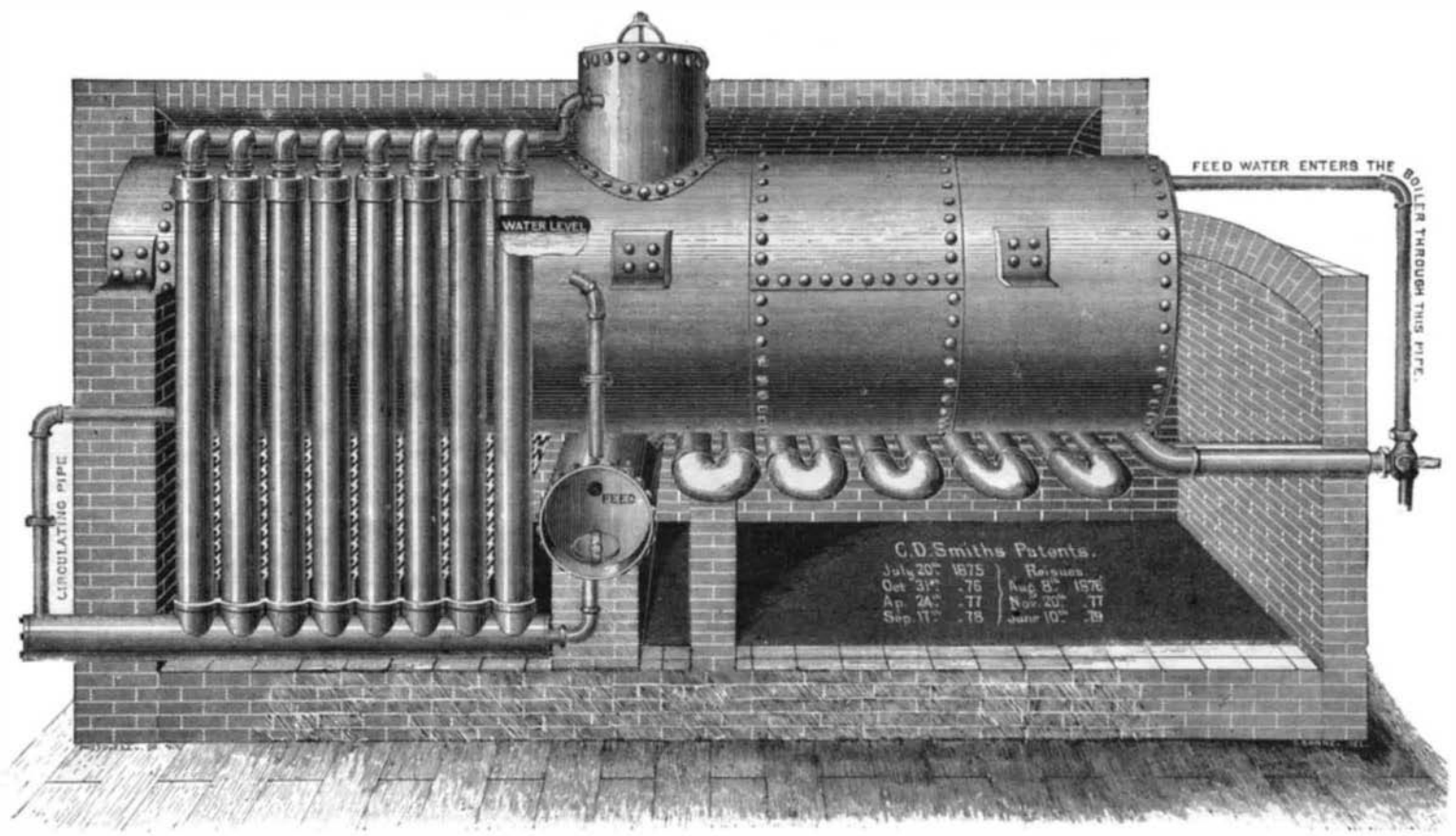
NEW INVENTIONS.

An improved adjustable rack, to be attached to brass band instruments, for holding books or leaves of music, has been patented by Mr. Charles Parent, of Biddeford, Me.

A telegraph operator at a railroad station is responsible for the switches, and is required to telegraph the approach of trains Besides this he has frequently to answer inquiries from other stations as to whether certain trains are approaching, and usually attends to the ordinary telegraph business. To watch the track he must frequently leave his table, especially if the track is curved, so that his work is not only interrupted, but there is more or less risk of its being improperly done. Mr. Sidney L. Palmer, of Serena, Ill., has patented an arrangement of reflecting mirrors, which convey to the operator's table a picture of the track extending in both directions from the station.

In training horses for trotting, toe weights are attached to their shoes to cause the horses to throw out the fore feet and make longer strides. but after a little service the weights in common use become loose and are with difficulty tightened on the shoe spur or clip. To avoid this difficulty, Mr. Peter Broadbooks, of Batavia, N. Y., has patented an adjustable toe weight that can be securely held in place.

An improved earring fastener, patented by Mr. Geo. Krementz, of Newark, N. J., consists in a forked spring sliding in a circularly-bent tube, and having an ear wire projecting from one end of the bent tube attached to one shank, the other shank being provided with a catch for locking the spring and the ear wire.



SMITH'S WROUGHT IRON WATER WALLS FOR STEAM BOILER FURNACES.