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Stove for Heating Furnace Blasts.

An ingenious mode of utilizing the waste gases from blast furnaces has been invented by Mr. John Player, of Norton, Stockton-on-Tees, England, by which they are drawn into a stove by a steam jet and consumed to heat the blast for furnace with either closed or open tops. It is well known to iron-workers that a highly heated blast is very effective in the fusing of the ores. Where the waste gases are consumed in contact with the pipes they must be kept at a red heat which, in time, disintegrates and destroys their material. Mr. Player's stove consumes the gas in a separate chamber from that containing the pipes to be heated; sufficient air is allowed to enter to cause an intense heat; the heated fumes escape through a series of narrow slots into an air-tight chamber having a damper on the top and containing a series of vertical pipes through which the blast to be heated travels. As the highly heated fumes will not again ignite without a fresh supply of oxygen, the cast-iron blast-pipes remain uninjured under a heat of 1,100° or 1,200°.

An auxiliary fireplace for burning coal is shown attached to the hot blast stove, which is only used at places where gases are not utilized, as is shown in Figs. 2 and 4. From this fireplace a flue conducts the flame and smoke into the combustion chamber where the combustion is completed. Attached to the end of this fireplace (merely for convenience of illustration) is shown a branch gas pipe with a small steam jet placed near its orifice to create a partial vacuum and this branch gas pipe is connected with flues at the furnace top and forces them into the stoves where they are burnt. Where this branch gas pipe and steam jet are used there no necessity for using the fireplace. They may be placed at the bottom end of the combustion chamber of the hot-blast stove, where the flue of the fireplace is shown in Fig. 2.

The arrangement of pipes is shown in the engraving: each stove contains 18 pipes, 8 inches in diameter by 14 feet high, giving about 1,000 square feet of heating surface. The pipes are disposed three in a row; the blast thus passing up and down three times, as is shown in Fig. 1. The steam jet in the branch gas pipe enables the furnace manager to control all the gases in the blast furnace to be used in stoves, etc., which by this means will work effectively when placed on the ground.

Already nearly a hundred of these stoves are in operation in England, giving unqualified satisfaction, in some cases having increased the quantity of ore melted with a given amount of coke from 34 to 40 per cent on account of the higher temperature of the blast. Mr. Barton, manager of the Carnforth Hematite Iron Works, at which sixteen of these stoves are in operation, writes to the inventor: "As regards the stoves, they continue to work very well, getting fair heats. I may say that we use no coal whatever, either for our boilers or stoves, and from the first we have never had the slightest trouble in using gas under your stoves."

James Henderson, 218 Fulton street, this city, is the agent for these stoves in this country, and he will furnish iron manufacturers and others interested any further information desired.

STEAM ON A STAMPEDE.

Translated for the Scientific American.

The late civil war in Germany, which has been remarkable for its rapidity of movements as well as for its immense devastations, has given rise to a new kind of war scenery, which was created by the use of steam and electricity.

The splendid railroad bridge across the Elbe at Pisa, the destruction of which became strategically necessary, was the first victim, and its ascending flames gave the first signal to the numerous locomotives and rail cars of Saxony to begin their inglorious but still remarkable flight toward the Austrian frontier.

The Prussian army, its right wing on the Elbe, invaded Bohemia and did not seem to care much about the railroads

in the western part of Saxony. The traffic was therefore continued on these roads and was according to the movements of the Prussians more or less reduced. On June 17th the latter took possession of the town of Waldheim and the passenger train arriving at the same time from Chemnitz was warned to return as speedily as possible. It had now become evident that the danger to these roads was great, the enemy not only tearing up the track and destroying all the bridges and tunnels, but also carrying off all the rolling stock that could possibly be made available. In Chemnitz the approach of the Prussians was announced, and all the rolling stock was

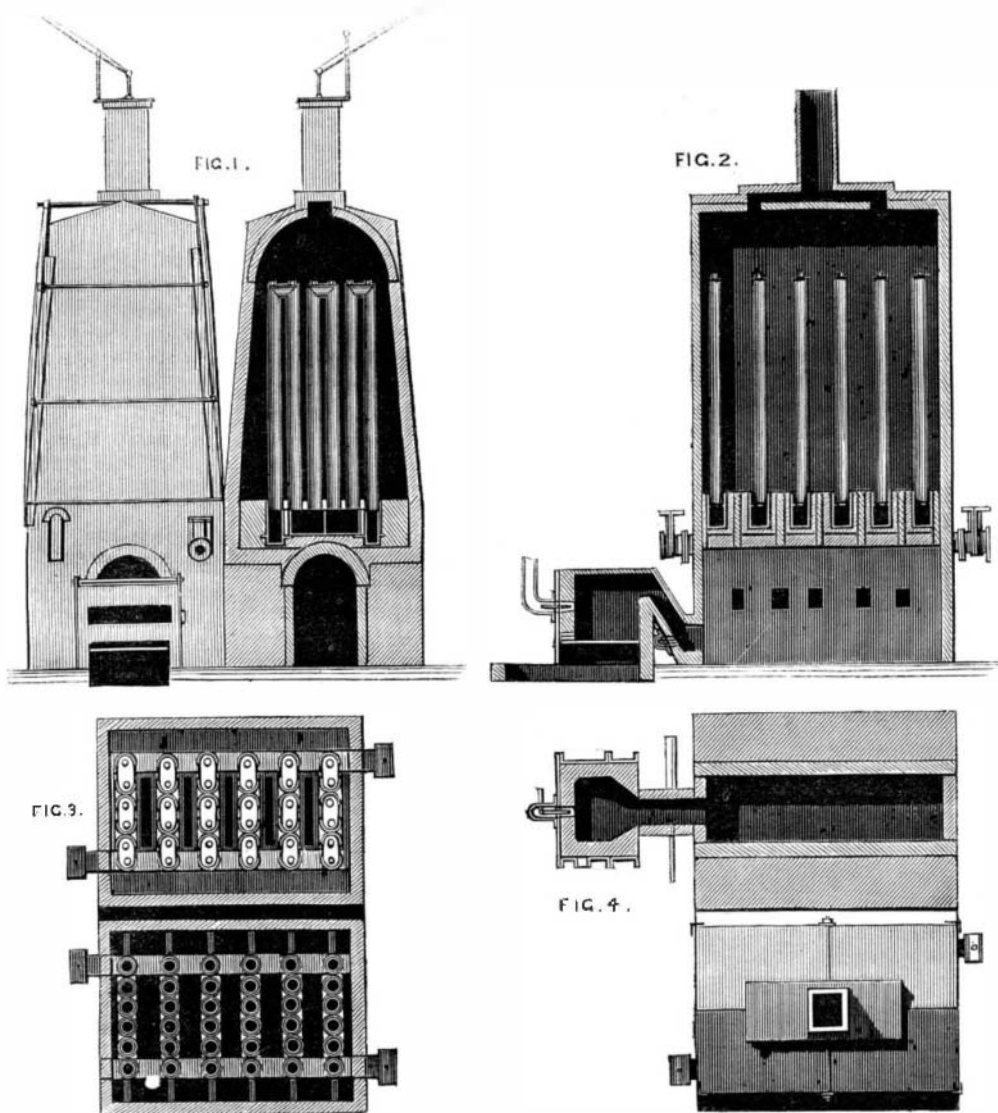
had arrived; it had been too quick in the Leipsic direction, and suspicions were consequently aroused. On the night of the 18th long trains left the Zwickau depot, drawn by the most powerful engines, and went without stopping to Reichenbach, in Bavaria. Long trains of locomotives were among them. At the latter place the news of the arrival of the Prussians at Leipsic was received, and as if the fires in the boilers had received an independent spirit, a sudden mysterious life seemed to be imparted to the iron horses and their long appendages, and away they went in inglorious haste toward Hof. Nineteen locomotives and several hundred wagons raced

thither. The bridge across the Goeltzich valley, which is more than a thousand yards long, and which is higher than most spires in Europe, is crossed in haste. In peaceful times the trains are most carefully signaled, and their speed is slackened as they approach this structure; but today they run across with roaring noise, making the mountains resound with their thundering echoes. The people in this valley will forever recollect this night. Aroused from their slumbers by a noise resembling the roar of great water floods, they jump frightened out of their beds. But behold fiery eyes look down upon them from the roaring monsters; shrill whistles intermingle their horrid sound with that of the thundering wheels. Yes, it was a train, and no flood; but what a train! With wondering eyes they could, in the twilight of the summer morning, see the endless line of cars moving across the magnificent bridge. A mighty column of steam and smoke rolls along, over and beyond the train, disappearing behind the far-off mountains. But now, train comes after train, wagon after wagon, all fleeing from Zwickau; the enemy has already left Leipsic on the wings of steam.

The Prussian train arrived at Altenburg from Leipsic as the mail train from Hof, not knowing of the late advances of the Prussians, was about to leave for Leipsic, and this mail train would certainly have fallen into the hands of the Prussians had they not been in too much haste, but, as it was, the mail train was warned and turned off to the right, returning to Goessnitz and thence to Werdau, giving the disagreeable information where it arrived. At Werdau everything was ready to start, and in a short time the whole depot was swept of the twenty-five locomotives and numerous wagons that had arrived there, and long lines of trains were again

fleeing, as fast as possible, the last engine leaving just as the Prussians became visible on the opposite side. The race now began, of the dimensions of which nobody can form an idea. The trains from Werdau united at the Werdauer curve with those from Zwickau. The fugitives went with the swiftness of the wind on both tracks at the same time. For a distance of eighteen miles, between Werdau and Herlasgruen the whole track was covered with the fleeing trains and engines. All order had ceased, confusion reigned supreme; first and second-class cars, coal cars, wood and mail cars, locomotives of different classes, all mixed together, each trying to evade the victorious enemy. Even the most prudent man must have felt uneasy, for what would have been the consequence if but one of the thousands of wheels had run off the track?

A fleeing army thundered along and announced war and misery. Peace and happiness seemed to leave the country with the empty wagons. In Reichenbach the flood came to a stop, on account of want of water. The depot there, which is over a thousand yards long and very wide, was completely filled with trains, and the power which should set all these masses in motion, slumbered in the reservoir, which was considerably distant from the town. Great embarrassment was thereby occasioned. Should all these rolling treasures, after having so far successfully evaded the enemy, still fall into his hands? No! Parties are sent up the road to tear up the track as soon as the train with the Prussians should appear. The water which is used to supply the town of Reichenbach is all conducted to the depot from the reservoir, and when it began to flow courage and hope returned again; the trains began to move on both tracks and arrived safely at Herlasgruen, thence to leave for Eger. At Herlasgruen the same want of water detained many trains which were not sufficiently provided with the precious liquid to enable them to pass that town; but they were supplied by the friendly inhabitants,



STOVE FOR HEATING FURNACE BLASTS.

thence brought to Zwickau, where, on the night of the 18th of June, forty-two locomotives and several hundred wagons arrived. Long trains, with three or four locomotives at their head were formed and left Chemnitz under the applause of the Saxons. The last two locomotives barely escaped falling into the hands of the Prussians, whose vanguard arrived just as they left.

All these encounters with the Prussian vanguard were merely accidental; the main danger for the rolling stock rapidly accumulating at Zwickau, threatened from a quite different quarter; the blow to be dealt was well considered, and showed, as did all the movements of the Prussians soon after, that they not only knew all the important points in the enemy's country but also the best means of securing them for their own benefit.

By looking at the map it will be seen that the railroad from Chemnitz, passing Zwickau, joins at Werdau with the line which connects Leipsic with Hof, a city in Bavaria. From the latter road, at a small station called Herlasgruen, a single track is laid to Eger, in Bohemia. That point beyond Werdau, where the two main lines which go from Leipsic and Chemnitz to Bohemia and Bavaria meet, is called the Werdauer curve, and if it falls into the hands of the Prussians, the entire rolling stock on both these roads, especially that which has accumulated at Zwickau, is cut off, and must fall into the hands of the enemy. The importance of retreat toward this point, was already shown on the 19th. The same corps of the Prussians which entered Leipsic at daybreak of this day, at once took possession of the depot and all the locomotives and wagons, and prepared a train for following the flying trains to Zwickau. A few precious hours were lost in preparations, and at six o'clock the trains left, and the great railroad race was inaugurated. The danger was felt in Zwickau, although no positive news of the enemy's approach