

**THE LYONS EXPOSITION ELEVATED RAILWAY.**

During the recent Exposition in the Park of the Golden Head, in Lyons, France, the curiously constructed elevated railway, shown in our illustration, was built to convey visitors from the Bridge of Morand to the gate of the Park. The mode of propulsion, it will be noticed, is very nearly the same as that first introduced in the Greenwich street railway, in this city. It consists simply of endless wire rope passing over drums at either extremity of the route, and actuated by powerful engines. The car is supported on trucks running on the single upper track, and of course can be readily disconnected from or attached to the constantly moving rope whenever it is required to arrest or resume its motion.

regions, depending on the use of iron, would receive a fresh impulse.

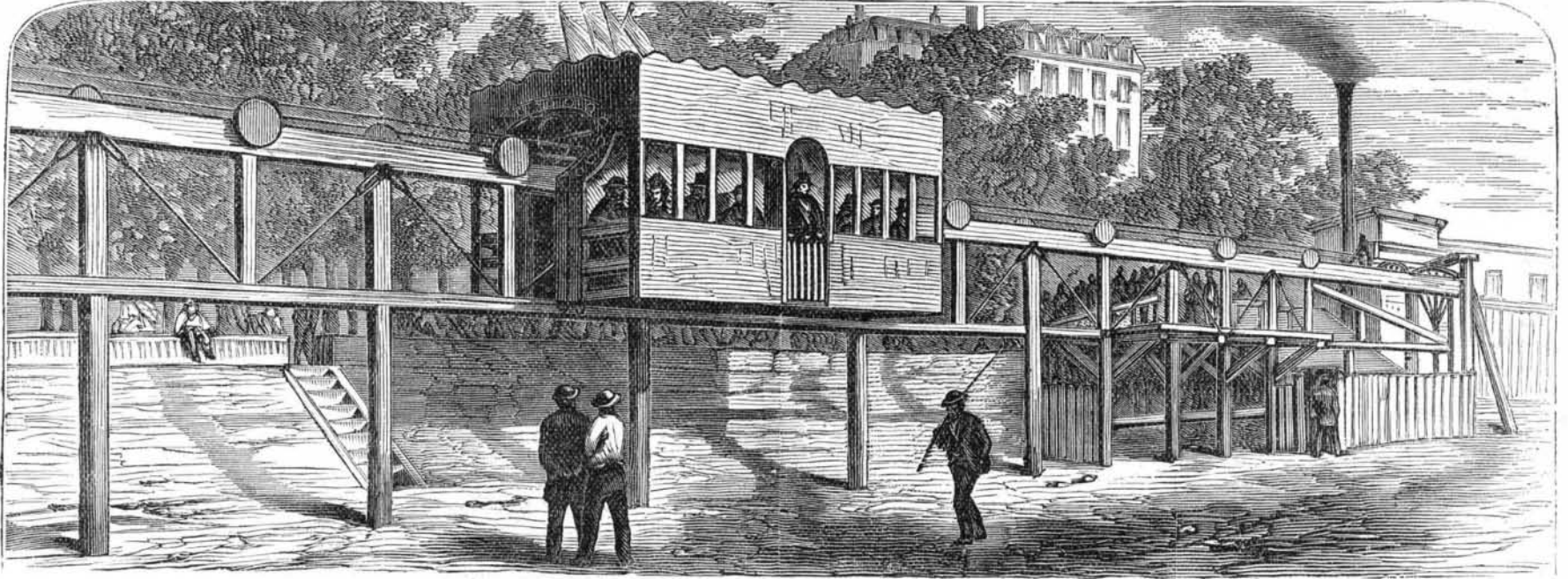
We herewith present an illustration of a blast furnace, invented by Mr. Khern, of Austria, which is said to fulfil all requirements. It is not stated where it is in operation, but should it prove successful, it cannot fail to be of great service to the manufacturer.

The following is a translation from a late number of the *Illustrirte Gewerbezeitung*, relating to this furnace: "Assuming that, in the higher zones above the belly, no alteration of the ores takes place, but that reduction and carbonization only commence in the latter, Mr. Khern accomplishes the preparation of the materials outside of the furnace, and this

and carbonization of the ore, but states that coked lignite was used in Austria in the quantity of one third of the charge of charcoal with complete success.

**The Marinoni Press.**

At the London International Exhibition was exhibited a six feeder Marinoni, printing the *Echo*, which is an improvement on Hoe's, and prints both sides of the paper at the rate of about 10,000 sheets per hour, or 20,000 copies of the newspaper, as the *Echo* is worked in duplicate. In its general features, it is similar to Hoe's, but the impression cylinders are, of course, doubled to obtain the printing on both sides of the sheet. The arrangement of flyers for taking off of

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This form of railroad, we learn, worked with satisfactory results over the short distance it was required to traverse. Its safety is plainly apparent, the entire weight of car and load being entirely beneath the wheels, so that no accident can happen except by the track giving way. The single upper rail is strongly made of wood, bolted together with heavy bolts and stays; the lower rail, acting as a guide for the car, is similarly built, and also serves as a brace for the upright pillars. The car was constructed to accommodate from sixteen to twenty people, and made in two sections, the openings being, as shown, in the sides.

**IMPROVED BLAST FURNACE.**

The utilization of brown coal or lignite, unmixed with other fuel, for the blast furnace, has thus far been an unsolved problem, it having been used at most in the quantity of one fourth or one fifth of the charge, the remainder being charcoal or coke. When used in larger quantity, it did not produce a sufficiently high temperature, and since it crumbles readily into fragments, its application for the production of iron has thus far been only a limited one. Turner, we believe, first pointed out the necessity of smelting under a high pressure, with hot blast and a larger addition of lime. Mr. A. Eilers, of this city, in a paper read before the American Institute of Mining Engineers, "On the Metallurgical Value of the Lignites," expressed substantially the same ideas. "To burn that material in the blast furnace," he said, "cylinder blasts are required, and perhaps it would also be necessary to close the top of the furnaces, in order to smelt under a high pressure, which may be regulated by the damper in the flue. The extraordinary results thus obtained, in producing high temperatures, by Bessemer are too new to require recalling. Nothing of this kind has, however, yet been tried in the West, but I hope that, during the present year, this subject will be thoroughly investigated."

The subject under consideration is evidently one of immense importance to the great West and Southwest. It is well known that those districts which abound in valuable iron ores are essentially barren, containing but little wood except cotton woods and willows; moreover they are devoid of either anthracite or bituminous coal. Yet there occur vast beds of lignites or brown coal. This coal is mostly of a black color and a resinous luster, and is streaked with brown, but is devoid of any wood structure. According to Professor Newberry, these lignites underlie not less than 50,000 miles in the Great Basin and along both flanks of the Rocky Mountains. At present a great deal of this fuel is being used on the locomotives of the Union Pacific and Central Railway companies, where no high temperature is required; but the use in blast furnaces, for the reasons referred to, is now virtually given up. If a method was discovered, or a furnace invented, by which this fuel could be directly used, namely, without the employment of costly gas generators, it would be of the utmost importance, for the railroad companies could then produce their own rails, and the various industries of those

does away with two thirds of its whole height. The same is only seventeen feet high, or as high as the belly, the ascending gases being used in this particular apparatus to char the lignites, to roast the ores, and to heat the blast. *a* is a cylinder for the reception of the ore and the prepared fuel; *b* is another cylinder which, when lifted by means of the rods, *c*, attached to levers, allows the charge to drop over the cone, *d*, into the furnace. *e* is a reservoir for the gases; these pass through *f* to the ovens for carbonizing, to the roasting furnaces and the apparatus for heating the blast, to be conveyed to the stack, *E*. The ovens for carbonizing are built in such a manner that the gases, issuing from the furnace, pass through two channels divided by a partition, above which there are, in two rows, eighteen or twenty boxes, made of cast iron, of a capacity of one tun each. They are provided with covers, and serve for the reception of the

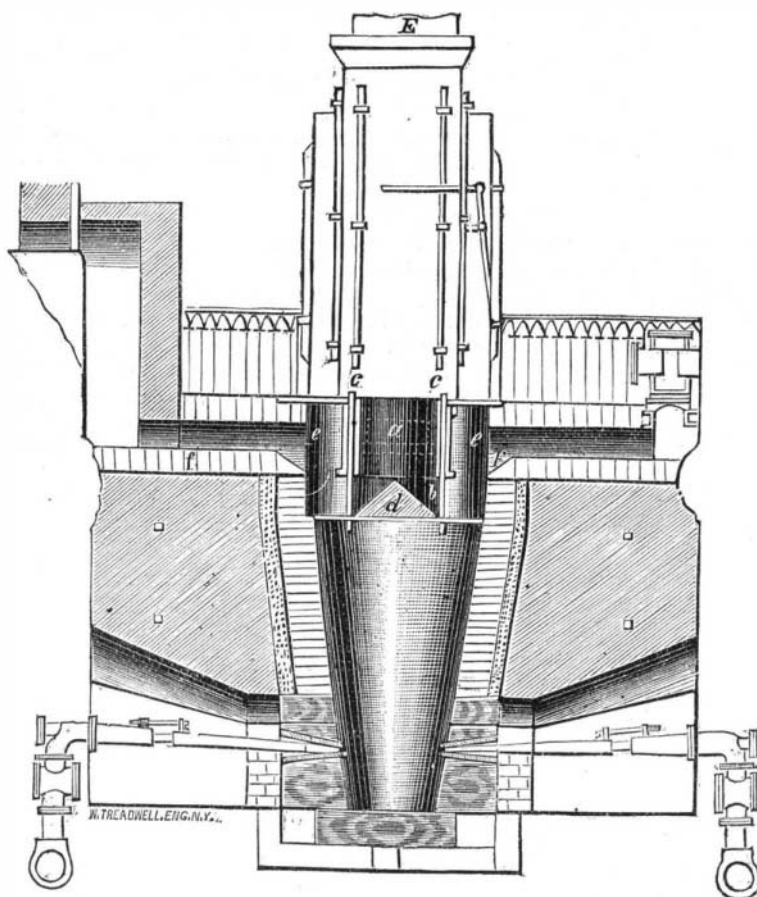
course dispenses with labor, but six men are necessary to lay on the sheets. Each sheet represents, as we have said, two papers, which are divided by a rotating circular knife in the middle line of the machine, cutting the paper in the direction of its travel. Both this machine and the "Walter" exhibit a very great advance in fast working printing machines, but while the principle of the former has probably been brought as near to perfection as possible, the application of that of the latter is only in its infancy as regards the production of vast numbers of newspapers in an incredibly short space of time.

**Twenty Dollar Tea.**

The greatest dainty that the palate of a Chinese craves is *fan chow*, the flower of tea. A San Francisco *Chronicle* man had the opportunity, a few days ago, to sip the imperial tea bloom, the priceless beverage of celestial extravagance. Learning that the enterprising firm of Castle Brothers, 213 and 215 Front street, had samples of a very rare tea, he visited the counting room of that firm, was shown the samples, and directed to Tuck Chong & Co., Chinese wholesale merchants, at 739 Sacramento street, for information. Tuck Chong, an urbane Chinese, received the reporter kindly, listened to his request to be shown the imperial leaf, and brought in the priceless luxury in a small and highly ornamental box of sandal wood. The slide lid was pulled out, and six alternate layers of perfumed rice paper and silk were carefully lifted.

Beneath all this covering was a gilded square piece of sandal wood. This also was lifted, and the tea blossom was displayed. Rolled in balls, twisted into tiny, flame-shaped rolls an inch long, twisted very small, tied in little bunches, like cigarettes, at one end and whipped into shreds at the other, was the tea flower, packed in loose petals of its own kind, to preserve its fragrance.

"This," said Tuck Chong, "is a tea that only mandarins of highest rank ever get a chance to drink in China. It is grown on the plantation of a very rich mandarin, in the province of Foo Chow, and can only be gotten from him or his agent in Peking. There was once a law forbidding its export, but even an American can now buy and drink it. It costs \$10.50 in China. My brother brought back a few pounds on his last visit to China. I have none for sale, but it could not be sold in San Francisco for less than \$20 a pound."

**KHERN'S BLAST FURNACE FOR THE USE OF LIGNITE.**

fuel. The bottoms, as well as the sides, are exposed to the gases, and pipes convey the generated tar vapors into condensers. Such a blast furnace, with the other furnaces mentioned, is said to cost \$46,500, gold, and it is stated that 100 pounds of white pig iron may be produced by it for \$1.07, gold, which would make \$23.96 for the long tun of 2,240 pounds.

In conclusion, we would remark that Mr. Brunner finds the height of the furnace too low for the complete reduction

**FLEXIBLE STONE.**—We are indebted to Mr. Samuel J. Blume, of Nazareth, Pa., for a specimen of itacolumite, or flexible stone, a curious mineral, of which he is in possession of several samples obtained by him in Stokes Co., N. C. In Brazil and the Ural mountains, diamonds have been found in the itacolumite rocks; but, in general, the diamonds are obtained from the soil in the vicinity of the above rocks.

A SPRING of naphtha has been discovered at Caserta, Naples.