A FLYING TRIP TO THE WEST.

[Special Correspondence of the Scientific American.]

MESSRS. EDITORS:—The great Pennsylvania Railroad, along which I have come, is one of the few in the country in which speed is obtained with safety and comfort to the passengers. It is so illustrious an exception to the common rule as to deserve notice, and as I am deputed by you especially to describe the important inventions with which I may meet, and as a most important one is in practical operation on this road, I have stopped over at Altoona to examine it carefully and look through the well-appointed shops of the company. You, who have traveled everywhere and know everything of importance, are aware that the whole track from Philadelphia to the "Smoky City" is bedded with stones, and that one is not suffocated with dust, as on some other of our great routes; and when I tell you that the wooden bridges are being replaced by iron ones, that new and powerful engines are being continually brought into use, that watchmen pass continually along the line to notice derangements or defects in the track, and that the vigilant eye of Mr. Superintendent Scott is upon every department of the service, our readers will see that a trip over the Pennsylvania Railroad is not only pleasant from the nature of the country and instructive from the unexampled specimens of engineering which are to be seen, but can be made with an almost positive assurance of personal safety.

I met the superintendent upon the train, and as I expressed surprise at the manner in which the train was controlled, he was good enough to let me ride upon the engine to see the practical working of the Loughridge patent brake. This most excellent invention has been in operation upon this road for four or five months, and after being subjected to every variety of test, has proved its efficiency and utility to such a degree that the company have adopted it and are making arrangements to apply it to every train on the road. I was assured that a train moving at the rate of 30 miles per hour can be stopped in 600 feet after the brakes are applied, and without damage to the engine or cars. The engineer told me he was satisfied he could bring his train to a stop in the time that would be required under the old system to whistle "on brakes," and that he felt that one-half the risk of his occupation was removed.

This was my first ride upon an engine. The night was very dark, even the stars being obscured by clouds. We were a little behind time, and the speed of the train was rapidly increased to 45 miles per hour. What were my sensations you may perhaps imagine. The black darkness around us; the mass of the engine, made blacker and more cumbrous by the glare from the headlantern, and swaying unsteadily from side to side; the infernal scream of the whistle as we neared crossings, the flitting-by of mile-posts, telegraph-poles, piles of wood, cabins, and other objects that for one instant were lit up by the streaming rays of the lantern, and then leaped madly into the gulf of darkness beside us; miles upon miles of fence that melted from our sight like thread passing through flame; the grimy features of the fireman frequently illumined as the door of the fire-box was opened; all this, with the passage over steep embankments of unknown hight, and of bridges that seemed supported in mid-air, kept my senses in a keenly active state. Although I had come to examine the patent brake, I could not look at it until I had become somewhat familiar with the novel situation, and when I did turn to look at it, it was with difficulty that my stunned organs of hearing could distinguish the words that Mr. Scott vociferously shouted to me as we flew along "at headlong speed."

Its construction is as follows: Alongside the throttle lever there is another lever which communicates with a 10-inch friction-wheel, and presses it against the flange of the rear driver, at will. This causes it (the friction wheel) and its shaft to revolve, and a chain attached to the brakes throughout the train is wound on the shaft. On the shaft is a ratchet wheel with a pawl, so that as the chain is wound to any given strain it is kept in place. In connection with it is a weighing-beam by means of which the power may be graduated on the brakes to suit the condition of the rails. A weight sliding on the notched weighing-beam gives more or less power as it is slipped from or to the fulcrum, and, once gaged, the engineer cannot put more power on the brakes if he wished, or should not wish, to; but he can apply any degree less than the fixed maximum down to zero. The beam is fixed so that the engineer cannot slip the wheels, nor break the chain, but can get what power he wishes up to the slipping point. And this is all that is requisite, for if the wheels are slipped, the retarding power is lessened rather than increased. To loose brakes, a small lever is pulled, and the pawl being thrown out of the ratchet, the chain is suffered to unwind. The great beauty of the contrivance is the weighing-beam, for if the power were not gaged, the engineer by braking up too suddenly, would snap any chain that might be used. To relieve the enormous shock which comes upon the pawl as it is thrown into the ratchet, the inventor has attached to its end a long gum spring, which effectually absorbs the sudden strain. The lever once thrown back, the ratchet and pawl below hold the brakes in place, so that the engineer need only put on the required power, and may then give his attention to the working of his engine. Coming to a station the speed of the train may be so controlled that the reverse gear need never be used. The cost of applying the brake to an engine is $75: to an ordinary car but $30. Until I took my first engine-ride I could not have realized the value of this invention. It needs to see with what marvelous ease the train may be controlled; how, when going at express speed, it can be arrested at once and without injury, and how, when approaching a station, the motion may be made to diminish by regular degrees until just at the right time the engine stops at the wood-shed or water-tank. When we reflect that frequently thousands of dollars and many valuable lives might be saved if a train could be stopped 500 feet sooner than is now possible, we see the value of this patent brake, and if other roads do not imitate the action of the Pennsylvania Central, it certainly will not be because Mr. Loughridge has not done his part.

In looking through the company's shops I noticed a new smoke-consuming fire-box, the patent for which was taken in our office. It is the invention of Gill and Grier, and has just passed successfully through a long comparative test with several other engines. It has been used on on one engine for four or five months, and is said to work well. In the fire-box is a deflector of copper and iron, with a water space inside it, through which pass 900 ¼-inch air tubes which communicate with an air-space above. The air space passes down to the bottom of the fire-box, and is fitted with a damper which enables a larger or less quantity of air to be admitted, as required. The air passes up the air-chamber and down upon the bed of coal, in jets through the ¼-inch tubes. This gives oxygen in proper quantity to every part of the flame, materially aiding the combustion of the smoke and gas. The patentees claim the introduction of air over and down upon the fire. With this apparatus an engine works free of smoke with an open stack, and the saving of fuel is claimed to be equal to the old waste of smoke, gas and sparks, equal to about 30 per cent. By using an open stack, of course, a longer exhaust can be used, and it is not necessary to cramp the engine to such a degree.

Of the grades over mountains, and the seeming impossibilities which by American genius have been overcome, I need not speak, for theyare known to every one; but of the company's shops I will say a word. They are all built of brick in the most substantial manner, have slate roofs, and cost at least $500,000. In the machine-shop is as pretty a line of shafting, 400 feet long, as I ever saw. It, and most of the finest tools were made by Sellers, of Philadelphia. The shafting has been run for seven years, and has never needed lining up, nor repairs. The pattern-loft contains the patterns for the whole road. Each piece is stamped with a number and a register is kept, duplicates of which are furnished to the other shops. By this plan articles can be ordered by their appropriate numbers, and they are cast in the Altoona foundry as wanted.

I shall go hence, according to my instructions, to the great West, and hope to get near enough to Freeport, Illinois, to see the trial of steam plows, but shall certainly see the fairs to attend which I have been sent.

HELIX.

Altoona, Pa., Sept. 10, 1859.

CANNEL COAL AND ITS OILS.

MESSRS. EDITORS:—An article with the above title, which appeared on page 151 of the present volume of the SCIENTIFIC AMERICAN, is calculated to convey a wrong impression with regard to a branch of manufacture rapidly increasing in importance. I allude to that portion of it in which the writer says that "two mines of cannel coal are at present known on this continent," of course conveying the impression that these are the only sources of supply, which, he further states, are mainly consumed at two places mentioned by him. His premises being correct, it would follow that these parties are the only ones who can furnish the true coal-oil. On the contrary, it is well known that the southern and south-eastern borders of the great Illinois coal-field, lying in north-western Virginia, northern Kentucky and the southern part of Ohio, contains vast beds of cannel coal. What is known as the "Root Vein," for instance, has been traced for many miles along the Kanawha, and its tributaries, and extends to a great distance on either side of that stream; while many other deposits, varying from eight feet to a few inches in thickness, has been discovered. There is, therefore, no scarcity of cannel coal, and the advantages indirectly claimed by your correspondent for the two companies mentioned, are far from being the fact.

But I will go further, and say that neither of the coals mentioned is truly cannel coal. The mineral known in commerce by this designation is characterised, chemically, by a larger proportion of hydrogen than other coals; it is generally of a brownish color, of a low specific gravity, exceedingly tough, breaks with a conchoidal fracture, and burns freely with a smoky flame. In some specimens it borders closely on lignite. Under no circumstances, however, will it become soft and "elastic as india-rubber," which fact at once characterizes the Forest Hill coal as certainly not cannel, whatever it may be. It approaches much nearer to bitumen in character, I should think, though I have never seen it. The Albert coal appears to be an article *sui generis*, but is certainly nearer allied to bituminous coal or bitumen than to cannel coal.

The statement of your correspondent with regard to bituminous coal is correct in the main. Burning oil can be made from bituminous coal; but it can never be a profitable operation, as the quantity is too small and the difficulty of purifying it very great. A very important distinction, and one which characterizes both oils, is, that while the solid ingredient of cannel oil is mainly paraffine (C_{20}. H_{20}.), bituminous oil, as well as that from the Albert coal, contains napthaline as the solid ingredient, with a very small per centage of paraffine. The latter substance is the best solid illuminating ingredient yet discovered. Agreeing in composition with olifiant gas (the illuminating portion of coal gas), it burns without smoke and gives a pure light of great intensity. Naphthaline, on the contrary, from its large per centage of carbon, is totally useless as a burning material, and has not, as yet, been found of practical value in the arts. I say not as yet, for I believe it will yet be found exceedingly valuable, yielding, by its decomposition or combination, substances of great economic value. Alizarin, for instance, the drying principle of madder, is identical in composition with one of the derivatives of naphthaline, and not unlikely will yet be obtained from it; and other instances of a similar coincidence might be mentioned. There is here a most promising field of discovery.

The different composition of paraffine and naphthaline gives a key to the different characters of crude coal oils; but as this letter has already reached too great a length, I will reserve till another opportunity the consideration of their character and composition.

H. S.

Stamford, Conn., Sept. 3, 1859.

CORNS AND CHILBLAINS.

MESSRS. EDITORS:—The following effectual methods of treating corns and chilblains may be of use to many of the readers of the SCIENTIFIC AMERICAN:—

A corn, when closely pared, resembles an onion in its layer. The way to treat them is to use a sharp pointed knife and commence paring at the center, taking care to remove layer after. This may be done without causing pain or drawing blood. When the whole corn is removed a cavity is formed in its place, protected by the natural flesh and skin. This is now to be covered with a piece of common sticking plaster, which should be kept on for one or two weeks. For chilblains, I have found that warm linseed oil rubbed on them is a very good remedy, and to this I sometimes add a little spirits of turpentine.

E. S.

New York, Sept. 12, 1859.