AN AUTOMATIC MECHANISM FOR OPERATING MINE-DOORS.

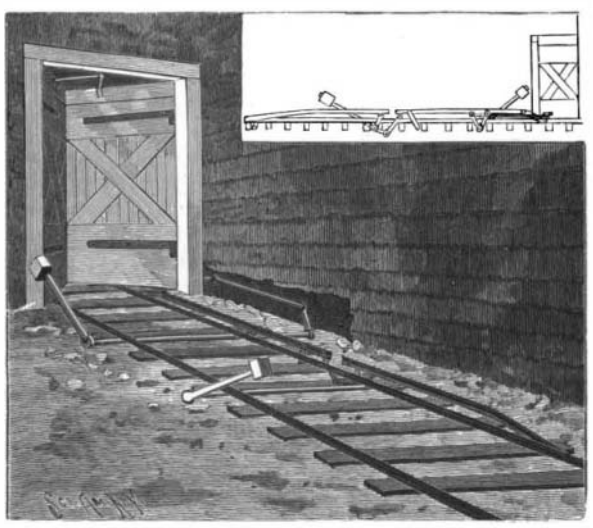
An ingenious mechanism has recently been patented by Alfred N. Humphreys and Edward McGrew, of Irwin, Penn., which is designed to operate the doors of a mine by means of devices which are laid along the track leading into the mine, and which are operated by the wheels of a train.

The mine-doors in the present invention are hinged to stanchions and close at an angle to each other. A construction consisting of an arm rigidly secured to one of the doors, and pivoted to a link connected with the other door, insures the simultaneous opening of the two doors.

The door-opening mechanism comprises essentially two terminal wheel-bars mounted adjacent to one of the rails, and an intermediate wheel-bar connecting the other two.

The two terminal wheel-bars are supported at their outer ends on links pivoted in housings. The one terminal wheel-bar has a connection with the intermediate bar; the other terminal bar is joined to the intermediate wheel-bar by means of a bell-crank lever, as shown in the small side elevator. Shafts connected with the inner ends of the terminal bars extend across the railway and, at the side opposite the bars, carry arms provided with weights serving to return the parts to their normal positions after having been acted upon by the wheels of a car.

The intermediate bar is designed to operate the mine-doors through the medium of a rock-shaft, a crank-arm, and a link connected with one of the doors. The rock-shaft extends across the track and carries a weighted arm which is designed to return the intermediate bar to its initial position and to close the doors after a car has passed.



AN AUTOMATIC MECHANISM FOR OPERATING MINE-DOORS.

As a train approaches the station from either side, the wheels will depress one of the terminal bars. This depression will cause the links and other connecting mechanism to depress the intermediate wheel-bar. As the intermediate bar is depressed, the rock-shaft will pull upon the link connected with the main door and thus open the doors. After the train has passed between the open doors and over the last wheel-bar, the weights carried by the arms on the several shafts will return the parts to their normal position and close the doors.

In order that the doors may be air-tight when closed the various wheel-bars and parts have been placed in such positions that they shall meet this requirement.

A FRENCH ELECTRIC LOCOMOTIVE.

The question of the electric traction of trains is a subject of ever increasing interest. Of the interesting experiments made by the Company of the West upon the Mantes line with the Heilmann locomotive, we have already given an account. Aside from these experiments, which are still proceeding methodically upon the section between Mantes and Rouen, the engineers of this company have just decided upon the electric exploitation of the new line constructed between the Champ de Mars and Versailles in view of the approaching exposition.

On another hand, the Company of Orleans has under consideration the project of having its trains hauled electrically in Paris as far as to the terminal station of Quai d'Orsay.

The Companies of the North and East are, likewise, making studies of electric traction, but the results of these are not yet kuown.

Finally, the Paris-Lyons-Mediterranean Company, which already has had occasion to apply electricity to the exploitation of the Berandière branch in the vicinity of Saint Etienne, and upon the Fayet line on the Swiss frontier, has, for a short time past, been carrying on some experiments between Paris and Melun with a high speed electric locomotive of which the nitial performances have proved very satisfactory.

Constructed after the plans of M. Auvert, engineer of the central rolling stock service, and under the direction of M. Baudry, engineer-in-chief of traction, the new electric motor did not at first reach the degree of perfection that it now appears to have attained. It was only after long tentatives and numerous experiments that it was possible to focus, so to speak, each of its parts. and to make of it that harmonious whole and marvel of power and precision that we at present admire.

The locomotive *E*1, begun toward the end of 1896, was not really finished until a few weeks ago, and it was only last month that, in the presence of a privileged few, it was submitted to its high speed experiments between Paris and Melun and return.

We have the good fortune to be able to offer our readers a reproduction of a photograph of the first electric train that ran over the principal lines of the Lyons system, hauled by the new locomotive. To the rear of the engine, of which one will remark the very peculiar form, is coupled a special car containing the accumulators, and a first-class coach in which, in the trial trip, were seated fifteen invited guests.

The locomotive is mounted upon three pairs of wheels of 3·6 feet diameter. The front axle alone is a carrier, the two others being motors.

Upon each of these latter are directly keyed the continuous current electromotors, which give them a rotary motion, and of which it is well to give a brief description, since these are the principal parts.

Their inductive system consists of two large horseshoe electromagnets placed one in front of the other behind the axle. The armature is of the Brown type, with conductors inclosed in iron. These latter, 150 in number, consist of copper bars of elliptic section. On each side of the armature there is arranged a collector, and four carbon rubbers serve to transmit the current.

The frame of the locomotive carries a box divided into five compartments. In the one in the front, the highest part of which does not exceed 4·25 feet above the axles, there is an air compressor actuated by a small electromotor of 5 horse power, and necessary for the operation of the brake, the whistle, and the starting mechanism. In the rear compartment, in which stands the engineman, are installed the levers and the maneuvering commutators. The three other compartments contain a rheostat for establishing or interrupting the current and 18 accumulator elements. These accumulators, which are of celluloid and of a special type, suffice to make the locomotive run with a reduced speed. In order to obtain higher speeds it is necessary to use the supplementary electric energy of 192 elements contained in the first car or tender, and the utilizable capacity of which is 1,000 amperes-hour. The weight of the engine and its tender in service is 198,660 pounds. The results, which, as we have said, were very satisfactory, were the following, in the course of the most recent experiments: The maximum load hauled between Paris and Melun, going and coming, was 147 tons at a mean speed of 27 miles an hour. In running, with the electromotors coupled parallel with each other, M. Auvert easily obtained a speed of 60 miles with a 100-ton train, and estimates that it will be possible greatly to exceed this without any inconvenience.

For the above particulars we are indebted to Le Génie Civil.

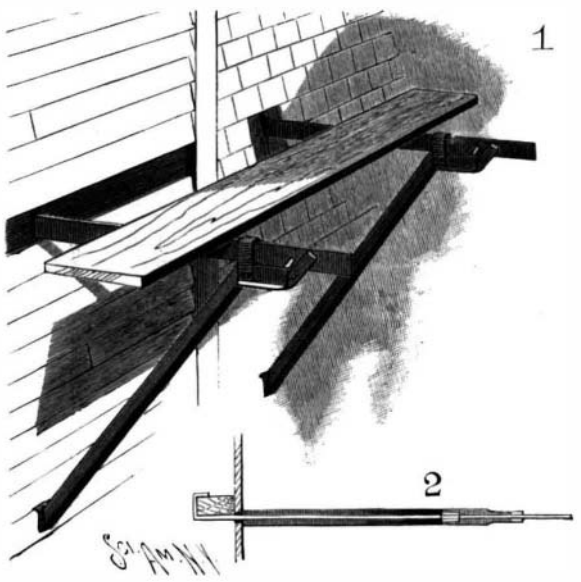
Erratum.

In our issue of January 28, 1899, we described and illustrated a stamp-mill referred to as "Parker's Rotary Ore-Stamping Mill," the invention of which was credited to A. A. Parker. The mill in question was invented by E. F. Parker, of Denver, Colo., and W. D. McDougall, Y. M. C. A. Building, San Francisco, Cal., and is known as the "McDougall-Parker Rotary Rapid-drop Stamp Mill."

A SIMPLE SCAFFOLD-BRACKET.

In the accompanying illustration we present a bracket for builders' scaffolds which has been patented by Louis S. Miller, 72 First Place, Brooklyn, New York city, and which is so constructed that it may be readily packed within a small space when not in use.

Of the accompanying illustrations, Fig. 1 is a perspective view of two brackets in position, and Fig. 2 is a top plan view of a bracket.



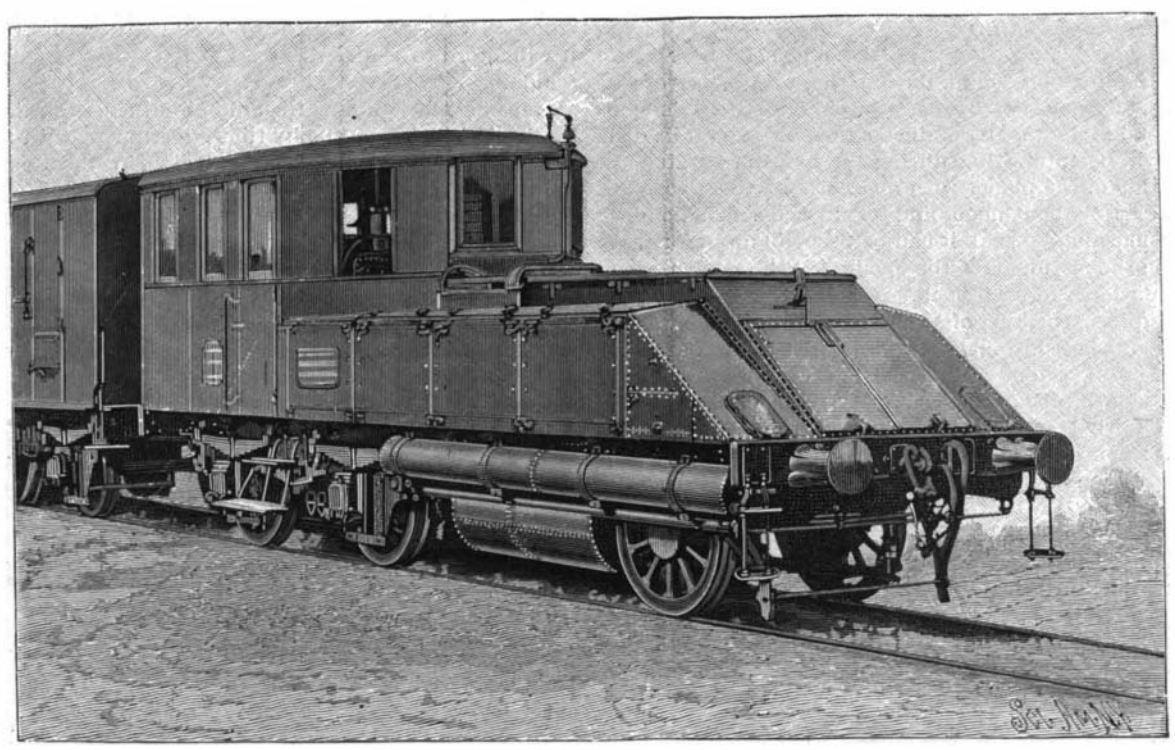
MILLER'S SCAFFOLD BRACKET.

The bracket has an arm with a hooked inner end engaging the studding, as shown in Fig. 2. The arm is supported at its outer end by a brace of angle iron formed with a tooth in its lower end adapted to be embedded in the sheathing-board to hold the bracket from lateral movement. The upper portion of the brace is turned outwardly at an acute angle to its body, and is provided with two cheek-plates which receive the arm between them. Between the cheek-plates a tooth is located which engages one of two notches in the arm. On the bracket a loop is secured through which the arm freely passes.

It should be observed that the arm is provided with more than one notch in order to adjust the bracket to various widths of studding.

The First Horseless Carriage.

Vaucanson invented a horseless carriage some one hundred and fifty years ago. In a document which has recently been discovered it is recorded that the mechanician was honored, in 1740, by a visit from Louis XV. for the purpose of inspecting the carriage which ran without the aid of a horse or other visible means of propulsion. Two persons in the vehicle made the round of the courtyard to the satisfaction of his majesty and suit. but, though a promise was secured of royal patronage, the Academy of Sciences declared that such a conveyance could not be tolerated in the streets, so the scheme had to be abandoned. The motor power was supplied by a huge clockspring, so that only a short journey was possible, but the gear seems to closely resemble that of the horseless carriages of to-day.



THE NEW ELECTRIC LOCOMOTIVE OF THE PARIS-LYONS-MEDITERRANEAN RAILWAY.