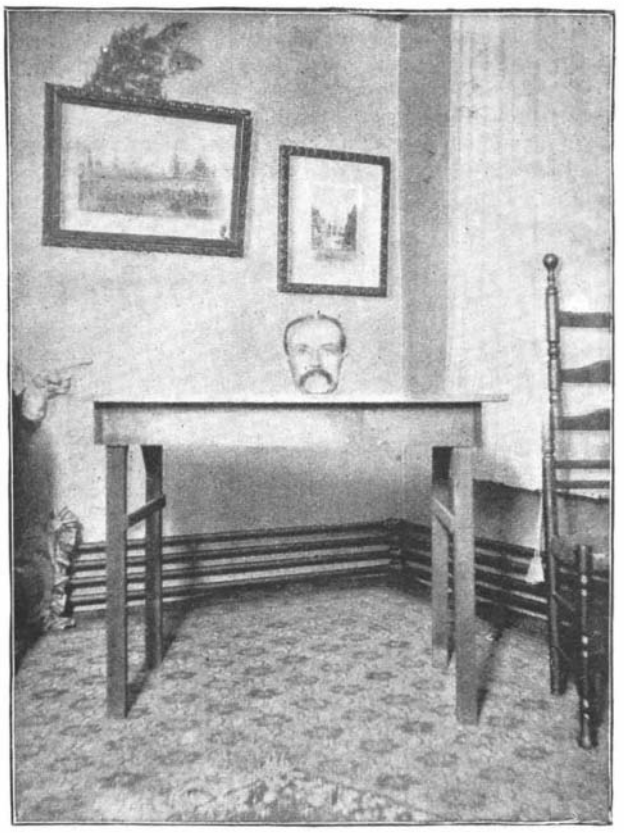
PHOTOGRAPHING A HUMAN HEAD UPON A TABLE.

In the SCIENTIFIC AMERICAN of March 3 Mr. Gilmore showed how, with a box placed on the front of a camera, "duplicate" pictures might be taken. Again, in the SCIENTIFIC AMERICAN of March 24, the same gentleman showed how the head of a living person might be represented as resting upon a platter on a dining room table; the tablecloth hanging down in front of the table so as to conceal the person who is sitting under the table. When I read these two descriptions, I wondered why Mr. Gilmore did not combine his two ideas, viz., of the "duplicate" and "decapitated" pictures -- throw the tablecloth aside and prove by photography that the head on the table is in no way connected with the body under the table, as shown by the accompanying representation.

This picture was made in this way. A table is provided with a top as shown here, having a portion of the top, as A, removable.

The person whose head is to be photographed sits in a chair underneath the table. The board, A, is removed to allow the person's head to pass above the table. The board is again placed in position on the table, and the closer the person's neck fits the hole, B, the better.

A camera is arranged with a box as described in the March 3 number of this paper; but in this (the above) case the camera is turned so that the two doors in the box, C and D, open up and down, instead of sideways. The camera is raised or lowered until the crack between the two doors of the box is on a level with the edge of the table. Now the upper door, C, of the box is opened wide so as to expose to the sensitive plate, when the shutter is worked, the head above the table and all objects in range of the lens above the edge of the table. After the exposure is made with these arrangements, the person whose head has been photographed has nothing more to do with the picture, and he may leave the room. The top door, C, is now closed, and the bottom door, D, is opened wide. By this move you protect the upper part of the plate from a second exposure and leave the way clear to expose the lower and as yet unexposed part of the plate.



PHOTOGRAPHING A HUMAN HEAD UPON A TABLE.

The shutter is again worked, and this time everything in range of the lens below the edge of the table has been photographed, and, of course, not showing any one under the table. This picture was taken by flash light.

JAMES BURT SMALLEY.

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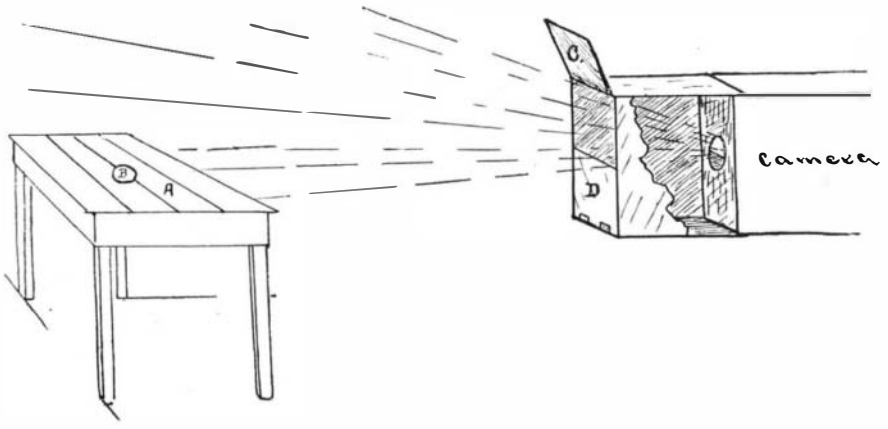


Electric Railway Dangers.

At a recent meeting at Washington of the National Electric Light Association Mr. J. H. Vail, M. Inst. C. E., of New York City, brought forward a number of interesting cases of electrolysis. Among them were the following:

A plumber in a Pennsylvania city was repairing a water pipe in a house; and, on breaking a joint, an electric arc formed across the ends of the pipe. The house was not in the direct path of the railway circuit. Investigation followed; and it was proved beyond question that there was insufficient electric conductivity of the track system, and also that the earth did not afford a good return, though the tracks were well grounded. It was found that the railway current was traveling along all pipe systems in its effort to complete the circuit to the dynamos in the power station. Actual tests were made with standard instruments. From 135 readings of the ampere meter, it was found that the water pipes leading into the station carried an average current of 93 amperes. Further tests showed that, with 23 cars in operation, 40 per cent of the total current was carried by underground pipes.

Another interesting case was brought to light by a fire in the basement of a house. After it was extinguished, it was found that the current of an electric railway system had been carried along the iron water pipe entering the house. It is believed that, by vibration of the floors, this pipe and a gas pipe were brought repeatedly into contact—each time forming an arc between them. In this way a hole was eaten into the gas pipe and the gas was ignited. After an analysis of the whole matter, Mr. Vail felt justified in recommending the adoption of the complete metallic circuit as the standard for the best railway practice.

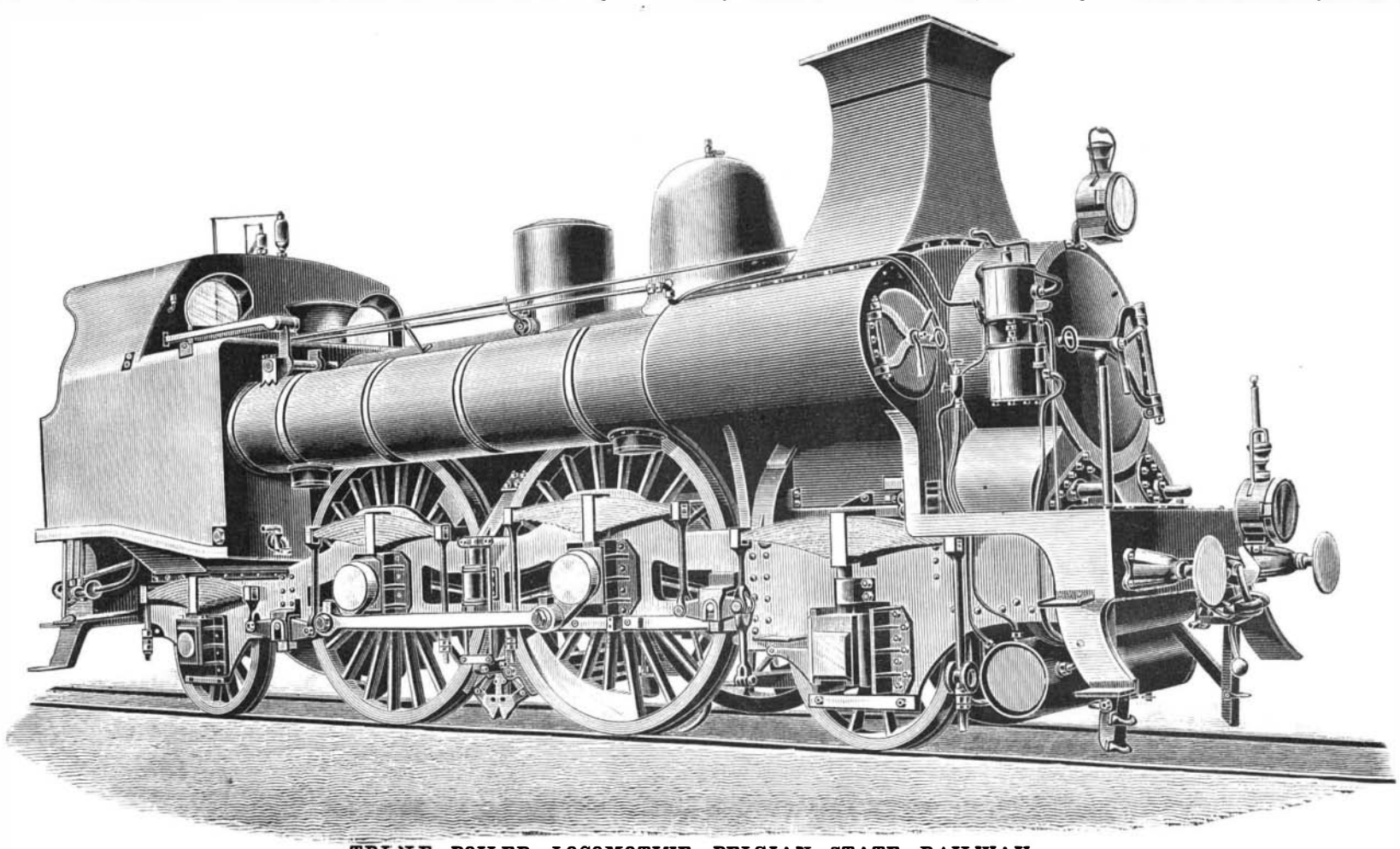
TRIPLE BOILER LOCOMOTIVE, BELGIAN STATE RAILWAY.

The curious-looking locomotive which we illustrate was built in 1888 by the Societe St. Leonard, of Liege, Belgium, and exhibited at the Paris Exhibition of 1889.

In calling for competitive designs of new engines, the authorities required that the competing locomotives should be able to haul a gross load of 150 tons up a gradient of 1 in 200 at 56 miles per hour, without diminution of steam pressure or of the level of the water in the boiler for a distance of three miles at least. The triple boiler engine ran up the grade stated at 61 miles per hour, and took trains of 150 tons gross (that is, including engines) up inclines of 1 in 62 at 40 miles per hour, and, on other occasions, loads of 182 tons up the same gradient at 31 miles per hour. At 59·4 miles per hour, with 150 tons, on a grade of 1 in 200, the power of the triple boiler engine exerted 1,339 horse power.

The engine illustrated has a boiler with three barrels, which have the same fire box tube plate, and the same extension smoke box in common. The chimney is square, spreading out at its base to embrace the side divisions of the smoke box, an arrangement which should improve the draught in the side flues, although it may be doubted if the exhaust steam acts so efficiently in a square chimney as in a round one, and it is certain that it obstructs the view somewhat. The smoke and steam, also, are said to be thrown less clear away from the engine than with the round forms.

The coal consumption is given as 254 to 322 kilogrammes per hour per square meter of grate surface, in other words, it burns an average of 3.167 lb. per hour, which, taking the commercial speed as 44 miles per hour, corresponds to 72 lb. per mile; 1 lb. of coal is said to evaporate 5·6 lb. of water upon the average, or 6·6 lb. as a maximum, results no better than obtained with American locomotives, but the coal burned by these Belgian locomotives is of the poorest "slack."



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