

by a continuous current give continuous trails on a photographic plate exposed in a camera which is kept in motion, whereas lamps fed by an alternating current give dotted trails when the camera is moved rapidly. The dotted lines in the photographs might have been caused in this way, (2) The trails are too low down to be caused by a lightning flash. I do not think the lightning flash appears in the photographs at all. I have seen photographs of remarkable multiple lightning flashes taken with a moving camera, some showing as many as forty different discharges in one flash, and I have also seen photographs of so-called beaded lightning, which appears to be due to the incandescence of the air particles along the path of the lightning flash, but I do not think the photographs of Mr. Duncan are examples of either.

A simple experiment will prove the truth or error of my explanation. Let a photographic plate be exposed at the same place and in the same way as those from which these prints have been taken, on a dark night when there is no lightning, and I feel confident that the result will be a number of trails caused by the electric lights of the city, similar to those on Mr. Duncan's photographs—Yours, etc.,

D. KENNEDY.

Great Britain has more doctors, proportionately speaking, than any other country in Europe. To every 100,000 persons Great Britain has 150 medical men, Germany 48, Switzerland 42 and Russia 15.

### New Invention.

The Problem of a Broken Wire.

Solved by a New Zealander.

The danger of the live wire has been known ever since there has been live wires carrying heavy current. Men took care not to handle them without due precautions. That was their own affair. If they neglected the precautions there was a funeral and nobody was to blame but the victim. But when the live wire broke, a thing it has a knack of doing sometimes, then there was no option of precautionary measures. The victim was electrocuted without knowing enough about it to make him use even the small modicum of sense that enables people to get in out of the rain. This danger has been familiar to science for many years, but science does not seem to have been able to find a way of making a broken wire safe. The perplexing problem has been solved by a young New Zealander. As soon as his patent gets abroad through the world—a consummation now being pressed on with all due speed—the danger of the broken electric traction wire will be a thing of the past.

Mr Newbould is the capable inventor who has thus come to the front rank, and he calls his invention the "Improved Automatic Cut-out for Electric Conductors." His first patent deals with traction wires, but it is interesting to know that he has another patent on the way, for dealing with light wires whenever they become danger-

ous to the public health by breaking and falling down among the crowds in the street.

This Automatic Cut-out is a machine in which equilibrium is maintained by an electrical balance between two currents in op-



M. G. NEWBOLD.

(Inventor of the "Improved Automatic Cut-out for Electric Conductors.")

position. In most electric tramways the current is fed from a feeder cable to the trolley wires at convenient distances, these wires being divided into insulated sections and the current fed to each trolley wire in each section independently. In applying the invention a machine is supplied to each section.

When there are two wires in the system a corresponding current is taken off from each of them, and the currents are utilised in opposition, to produce equilibrium in the apparatus, which is electro-magnetic. On the breakage of one of the wires its current ceases, and the equilibrium is at once destroyed, whereupon the remaining current operates a circuit-breaker which cuts out the broken section of trolley wire, with the

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