

## NEW VACUUM SWITCH STOPS IMMENSE CURRENTS SAFELY

Radical changes in electrical engineering practice are expected to follow the recent tests of the vacuum electric switch, the first outstanding product of the new high-tension laboratory of the California Institute of Technology. The new discovery is by R. W. Sorensen, professor of electrical engineering in the Institute.

Turning off a one-horse-power motor by the simple pulling of a switch releases a harmless blue spark, but when a hundred thousand horsepower of current is flowing, any attempt to interrupt the flow in the open air is about equivalent to the setting off of a dynamite bomb. Enormous oil-immersion switches, sometimes occupying acres of ground, have been developed in the attempt to quench the terrific arc that follows the breaking of the circuit.

In contrast to the huge oil switches, Prof. Sorensen's switch operates in a small glass bulb from which all possible air is exhausted. With the aid of Dr. R. A. Millikan's high-vacuum laboratory Prof. Sorensen was able to remove all but one billionth of the original air content of the tube. Advantage is thus taken of the fact that an electric current will not travel through a vacuum.

For the tests held at the large Laguna-Bell switching station the Southern California Edison Company furnished a current of 1000 amperes at 43,000 volts, while its inspecting engineers stood at a very respectful distance, expecting fireworks. Although the switch opened a gap only one inch across, the whole current of over fifty thousand horsepower stopped instantaneously without a tremor. The escillo-graph record of the current flow, which can easily detect a thousandth of a second of after-disturbance, indicates a clear break in the record as if somebody had sliced the paper with scissors.

With great city installations requiring the interruption of hundreds of thousands of horsepower of electricity the new vacuum switch promises to be of wide use. Simplification of the apparatus will mean extensive application to larger industrial motors - 15 horsepower and up - now requiring oil immersion switches.

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## EGYPT IMPORTED GLASS MAKERS FROM EUPHRATES

As long ago as 2500 B. C. the inhabitants of the Euphrates valley were making glass and a little later were selling it to the Egyptians. Then about 1500 B.C. some personage unknown had the bright thought of importing glass makers. Fifty years after the advent of the Syrian artizans into Egypt, according to Sir Flinders Petrie in a recent lecture before the members of the Society of Glass Technology at University College, glass was of as relatively common occurrence in that country as it is on the ten cent store counter of today.

There is no question that the ladies of ancient Egypt loved adornment, for beads, popular then as now, formed the principal use for glass. They were made not from liquid glass, since glass-blowing did not come into practice until the Christian era, but from glass paste. They also used it for making weights of considerable accuracy, said Sir Flinders, three of the same denomination having proved on testing to agree within one-two hundredth of a grain.

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