

PHYSICS

Same Current Gives Four Times The Light With New Lamp

Using Heated, Glowing Sodium and Krypton, New Invention Replaces Use of Filament and Points Way to Colder Light

A NEW electric lamp that approaches more closely the efficiency of the glow-worm's cold light and produces three to four times the amount of light on the same current consumed by the best of incandescent lamps has been made experimentally here by Dr. M. Pirani of the Osram concern, German lamp manufacturers.

It is a development of the familiar red neon lamps of advertising signs. Electricity is passed through a heated mixture of metallic sodium vapor and the rare gas krypton.

A brilliant yellow light is produced. Whereas a tungsten filament incandescent lamp wastes 90 to 95 per cent. of the electrical energy in the form of heat, the new sodium-krypton tube produces four times as much light per unit of electricity fed it and wastes correspondingly less current as heat.

The yellowness of the light is at present a barrier to its use for ordinary artificial lighting as the light from the tube causes common objects to take on unnatural hues. The light is given out by the glowing gases and not by a white hot solid as is usual in present lamps.

An unusual feature of the new light is that the vapors through which the current passes are heated in an electric stove before entering the tube.

Glowing gas tube lamps giving white light and operating on ordinary house wiring have been announced commercially in America. These tubes contain mixtures of rare gases of the atmosphere: helium, neon, argon, krypton and xenon. They use less power than filament bulbs but are not so efficient as Dr. Pirani's experimental yellow light.

Lighting of a type similar to this is already in use in a newspaper office in Berlin. Softly glowing tubes one inch in diameter are stretched all the length of an arched ceiling, about six feet apart.

Absence of eyestrain and uniformity of illumination are advantages of the new system but the initial cost of installation is too great as yet for private homes.

White light indistinguishable from daylight, but of low watt or power efficiency has also been obtained in Dr. Pirani's laboratory by the use of carbon dioxide gas in the tubes. Another daylight tube, containing a mixture of mercury and sodium vapors, has a somewhat greater efficiency than the best tungsten incandescent lamp.

Sodium used in the yellow tube is present in common salt. Krypton like neon is present in small quantities in the atmosphere.

The use of the 110 volt current is made possible in the new artificial light by a hot cathode, as in a radio tube. Electrons boiling out from this allow the current to pass at lower voltages.

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MECHANICAL ENGINEERING—PHOTOGRAPHY

Photographic Type-Setting Promised for Future

SETTING type by photography promises to invade the printing industry in a few years.

Three photographic typesetting machines that are designed to do the same work as linotype, monotype and other typesetting machines were described to printing experts recently assembled here at call of the American Society of Mechanical Engineers. Dyonis Uher of Budapest, Hungary, is the inventor of the Corex photo-typesetting machine. G. F. Bagge of Cleveland has produced a "fototypesetter." Parker Hart of New York described a "multicel photocomposing machine."

Instead of metal molds or matrices into which hot metal is poured to form the type, the photographic typesetter has images of the letters of the alphabet which are photographed on a film or other sensitized surface when the proper key is struck. From these photographic images, any kind of printing plates can be made by various processes.

Ultraviolet rays and ozone can be used to dry ink after it has been applied to the paper in printing, the ex-

perts were told by Robert A. Brown of Nashua, N. H. By playing artificial sunlight on the freshly printed paper, the oils in the ink are made to take up oxygen more quickly and thus become dry. Ozone, which is specially active oxygen, produces the same effect.

Chromium, the hard shiny metal that now replaces nickel on many auto parts, serves as a protective coating to type used in printing telephone directories and other publications that have large editions. Dr. Louis Weisberg, New York chemist, described this new application of electroplating.

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HYDROGRAPHY

Scientific Study Started Of Ice Currents in North

ICE from the North, and what brings it down into the navigated waters of the North Atlantic, will be the subject of a scientific research program lasting throughout the coming summer, under the auspices of the U. S. Coast Guard. A Norwegian scientist, Olav Mosby, has been sent out on the Coast Guard vessel *General Greene*, to work among the floes as they drift down the currents off the northeast coast of Newfoundland.

The expedition will be based at St. Johns, Newfoundland. The *General Greene* will stay at sea for periods of ten days to two weeks, and will then put back to base for fuel and supplies.

The ice involved in the recent *Viking* disaster off Newfoundland, Coast Guard officials said, was probably not of far northern origin, but came from local sources.

Besides the *General Greene*, which will take care of the strictly research side of the ice problem, the Coast Guard cutters *Ponchartrain* and *Mojave* will carry on the usual work of patrolling the steamer lanes in the iceberg regions, breaking up the bergs where practical and keeping steamers warned of their presence by radio. They will also keep Washington advised by daily radiograms of the distribution of ice. This work is carried on by international agreement, and is participated in by all the maritime nations of the North Atlantic, the United States having direct charge and furnishing vessels and personnel.

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As far back as 1835, chemists attempted to analyze rubber in the hope of some day making it synthetically.