

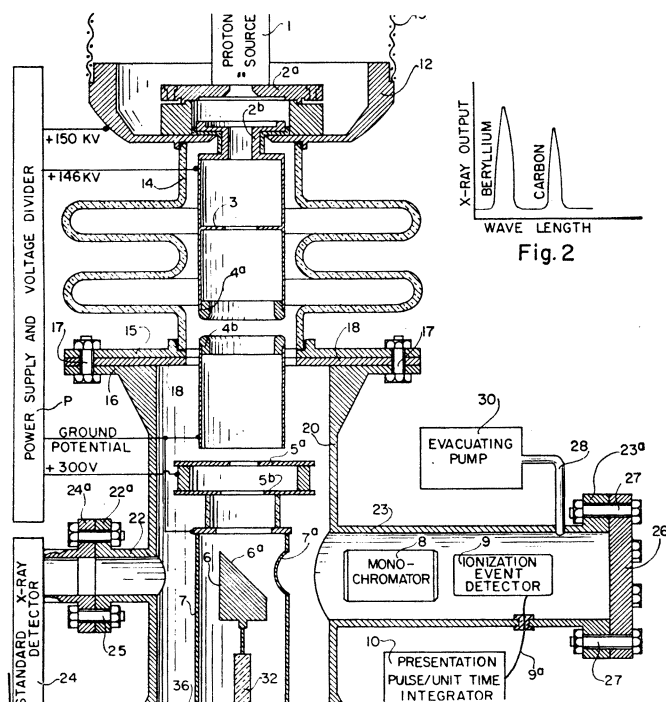
current patents

ANALYTICAL CHEMISTRY

Proton-excited X-ray analyzer

When chemical substances are bombarded with electrons, they emit X-rays which have different wavelengths for different elements. Such X-ray analyzers are useful for identifying the composition of unknown substances.

A drawback is that identification of elements below element number 12 (magnesium) is not too precise. The



bombarding electrons are unable to dislodge the electrons from the inner ring of lighter atoms to produce recognizable X-rays.

Protons are some 1,800 times more massive than electrons, however. Bombarding a sample with protons produces X-rays in the wave-lengths characteristic of lower atomic-number elements, according to Dr. Andrew A. Sterk, whose proton-excited X-ray analyzer was patented last week. The patent was assigned to American Machine and Foundry Co., where Dr. Sterk was employed when he developed the machine.

The longer wavelength, lower frequency X-rays produced in the proton analyzer have less penetrating power than the hard X-rays produced by electrons, and must be analyzed in an evacuated chamber.

The analyzer is especially useful in organic chemistry applications, says Dr. Sterk, since carbon, which has atomic number 6, is common to organic compounds.

An AMF engineer said the machine is able to detect the presence of oxygen in compounds of thin films down to 20 angstroms, or about one ten-millionth of an inch.

The analyzer has also been used to calibrate X-ray spectrometers for space applications, he said.

Patent 3,370,167

AUTO MECHANICS

Self-aligning headlights

More often than seems right, headlights out of adjustment mean a second run through the auto inspection station. Moreover, even properly adjusted headlights are out of line if the load in the car is changed, or during acceleration or deceleration.

A French inventor with the auto firm Citroen has developed a system for automatically adjusting the pitch of the headlights for changes in loading, road unevenness or speed changes.

The newly-patented device has rods parallel to the two axles which move up or down with the wheels. Lever arms translate this motion to a longitudinal rod that, in turn, causes the headlights to move up or down.

The system is arranged so that if both front and rear wheels move up or down together their actions cancel out. If one pair moves up and the other down, the effect is doubled.

A time-delay system prevents minor vibrations and bumps from causing the headlights to move too often.

Inventor Edmond Henry-Biabaud assigned the patent to Citroen.

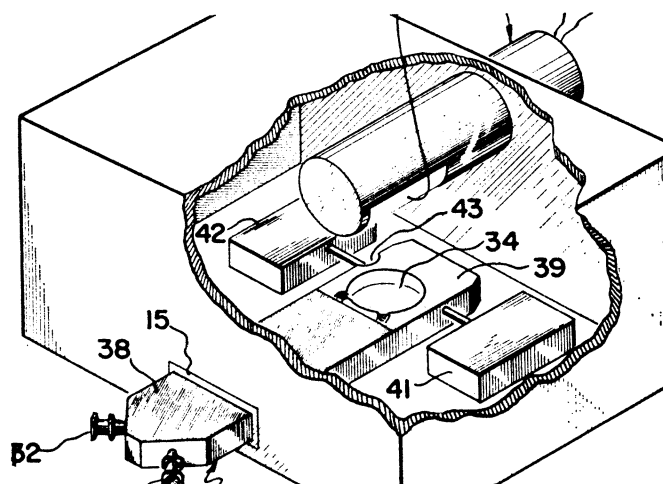
Patent 3,370,162

GAS DETECTION

Luminous bacteria announce poisons

A device that uses luminous bacteria and fungi to detect toxicants in the air won a patent for five engineers at North American Rockwell Corp.

A number of bacteria, such as *Photobacterium fischeri*, and fungi, including *Armillaria mellea*, give off light as they grow. The amount of light they give off is



sharply affected by such poisons as JP-4 jet fuel, unsymmetrical dimethyl hydrazine (UMDH) and chlorine, in such smaller amounts than affect humans.

In the device designed by the North American inventors, A. L. Jordan, E. R. Schnauss, E. H. Sie, Andrew Thanos, and E. V. Wagoner Jr., a photodetector measures the light output of the microorganism and signals any sharp change. Since the output of the detector decreases gradually even in clean air as food runs out, one circuit constantly adjusts for the changing base level.

Patent 3,370,175

9 march 1968/vol. 93/science news/243