

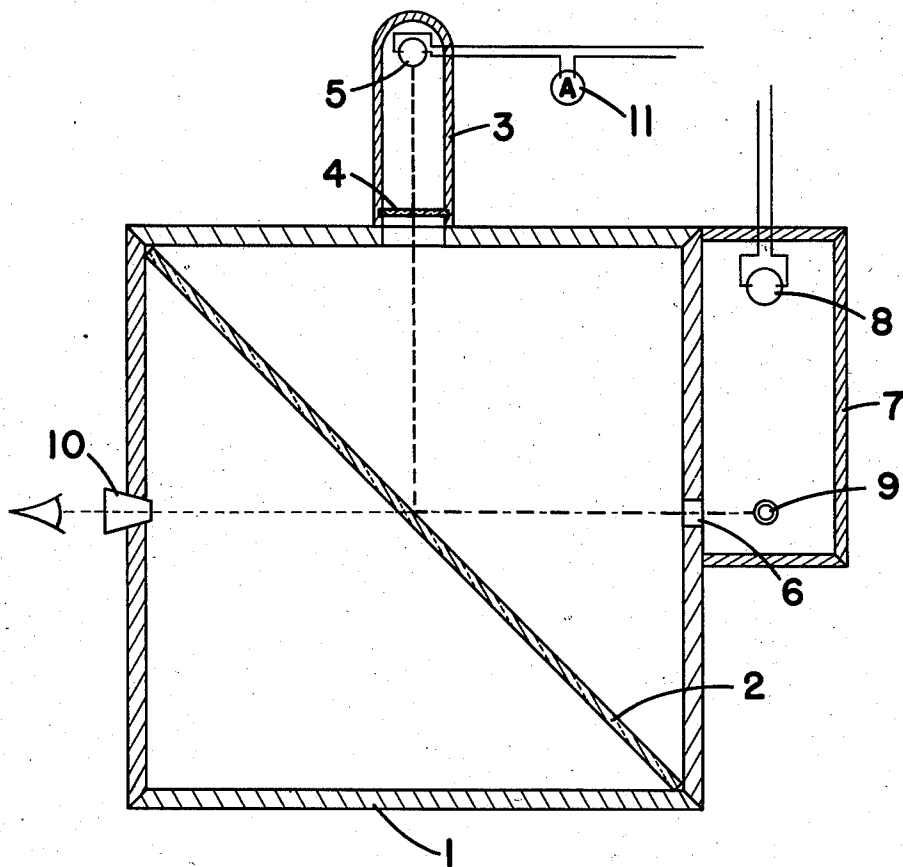
Dec. 15, 1942.

C. R. HOCOTT

2,305,082

GEOCHEMICAL PROSPECTING

Filed June 28, 1940



Claude R. Hocott INVENTOR.

BY

P. J. Whelan

ATTORNEY.

UNITED STATES PATENT OFFICE

2,305,082

GEOCHEMICAL PROSPECTING

Claude R. Hocott, Houston, Tex., assignor to
Standard Oil Development Company, a corpo-
ration of Delaware

Application June 28, 1940, Serial No. 342,848

4 Claims. (Cl. 250—71)

The present invention is directed to a method for prospecting for oil by examination of surface samples over an area to be explored.

It has already been proposed to prospect for oil by collecting samples of surface soil at spaced points over an area to be explored and examining the individual samples for their content of heavy organic bodies which have been referred to as soil wax. Customarily, this examination is made by extracting the soil sample with an organic solvent such as carbon tetrachloride and then evaporating the extract to dryness and weighing the residue. According to the present invention, the aforescribed method is expedited by extracting with a suitable non-fluorescent solvent for the so-called wax bodies, and examining the extract under ultra-violet light for fluorescence. In the preferred embodiment of the present invention, the preparation of the solution is made more rapid by subjecting the sample to refluxing with the solvent. The most commonly used solvent for this purpose is carbon tetrachloride.

The amount of fluorescence in the extract may be determined in several different ways. First, a series of known standards may be prepared and used for purposes of comparison with the unknowns. A more direct and reliable method is in the use of a specially designed fluoroscope.

A fluoroscope suitable for use in the method of the present invention is shown in vertical section in the single figure of the accompanying drawing.

Referring to the drawing in detail, numeral 1 designates a light-proof cabinet having a diagonally arranged reflecting surface 2, which is preferably clear plateglass. Extending from the top of the box is a closed tube 3 provided with a light filter 4, and with a source of ordinary light 5.

This light is so arranged as to cast a beam on the diagonal surface 2, which is reflected by this surface to a sidewall of the box, in which is arranged an opening 6. This opening is of smaller diameter than the diameter of the beam of light which is reflected by light source 5. The box has an auxiliary cabinet 7 covering the opening 6. In the top of this auxiliary cabinet is a source 8 of ultra-violet light, and in the bottom thereof, opposite the opening 6, is a test tube 9 or other suitable receptacle for containing the extract to be examined. In line with the opening 6 and on the opposite side of the box therefrom is an eye piece 10.

Experience has indicated that the majority of the extracts yield a fluorescence under ultra-violet light which is a blue light. Accordingly, the filter 4 is usually a piece of blue glass. In some fairly rare cases the fluorescence of the extract is of a yellow tint and in such a case a

yellow filter may be employed. The light source 5 is of adjustable intensity, and in the circuit thereof is arranged a suitable meter, such as an ammeter 11, for determining the amount of current supplied to light source 5.

In the use of the device, the extract obtained from the sample of soil being examined is placed in the receptacle 9, and the ultra-violet light 8 is turned on. The operator then sights through the eye piece 10 and adjusts the intensity of light source 5 until no visible line of demarcation between the large circle formed from light source 5 and the small circle resulting from the fluorescence is observed. When this point is reached, the meter 11 is read as an indication of the content of fluorescent material in the extract. A series of such readings are made with different samples, and the readings so obtained are correlated on a map with sample locations. It may be observed here that these samples are ordinarily taken as close to the surface as possible, preferably after scraping away the surface vegetation. Ordinarily, the samples should not include soil of depths greater than 5 inches. Samples of soil taken at the surface and at depths not substantially in excess of five inches are referred to in the appended claims as "samples of surface soil."

The nature and objects of the present invention having been thus described and illustrated, what is claimed as new and useful and is desired to be secured by Letters Patent is:

1. A method for surface prospecting for subterranean petroleum deposits which comprises collecting oil-free samples of surface soil at spaced points over an area to be explored, subjecting each individual sample to extraction with a solvent capable of dissolving wax-like bodies from the soil, said solvent being incapable of fluorescing under ultra-violet light, subjecting each extract so obtained to the action of ultra-violet light, and comparing the relative fluorescence of the various samples.

2. A method for surface prospecting for subterranean petroleum deposits which comprises collecting oil-free samples of surface soil at spaced points over an area to be explored, refluxing each sample with a solvent capable of dissolving wax-like bodies from the soil, said solvent being incapable of fluorescing under ultra-violet light, subjecting each extract so obtained to the action of ultra-violet light, and comparing the relative fluorescence of the various samples.

3. A method according to claim 1 in which the solvent employed is carbon tetrachloride.

4. A method according to claim 2 in which the solvent employed is carbon tetrachloride.

CLAUDE R. HOCOTT.