

## UNITED STATES PATENT OFFICE

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## MAGNETIZABLE FLUID

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4 Claims. (Cl. 75-169)

My invention relates generally to magnetizable fluid and particularly to a magnetizable mercury indicating fluid for use in measuring and gauging instruments and in industry wherever a magnetizable fluid may be employed, and an important object of my invention is to provide a fluid of this character which is in a practical and efficient form and which is relatively stable.

Other important objects of my invention will be apparent from a reading of the following description and example furnished for illustrative purposes.

The present invention provides a fluid which can be moved, distorted and otherwise modified as to volumetric shape and position by the impressing thereon of magnetic lines of force such as are prevalent in the magnetic field of a permanent magnet or of an electromagnet. For instance, the fluid of the present invention may be caused to rise for indicating and measuring purposes in a tube by placing a suitable magnet around or in the tube above or at an upper part of the column of fluid.

The magnetizable fluid of the present invention is made up of mercury (quicksilver), steel "dust" or filings or steel powder, and powdered graphite.

The steel "dust" when thoroughly mixed with the mercury becomes suspended and dispersed therein in such a way that when the magnetic field of a permanent magnet or of an electromagnet is brought to bear on the fluid, the steel particles will in moving toward the magnet carry the mercury along with them. The steel "dust" or powder particles must be sufficiently small to remain dispersed in suspension in the mercury and be of a sufficiently high grade of steel to be sufficiently highly magnetically permeable and exhibit a minimum of residual magnetism.

In order to sufficiently lubricate the mercury and steel particles to provide for desired ease of movement of the fluid in its container and to add to the magnetically sensitive character of the fluid, powdered graphite is also made an ingredient of the fluid.

In addition to exhibiting lubricating properties

the graphite acts to procure and maintain the uniform dispersion and suspension of the steel particles throughout the mercury. The mercury clings to the particles of powdered graphite, and prevents the steel particles from "classifying".

Experiment shows that not more than 14% by volume of steel filings can be suspended by mercury in the present fluid and as little as 2% by volume of steel filings is effective.

A preferred embodiment of the present invention is composed of:—

|                            | Per cent<br>by volume |
|----------------------------|-----------------------|
| Steel dust.....            | 14                    |
| Powdered graphite.....     | 3                     |
| Mercury (quicksilver)..... | 83                    |

Although I have shown and described herein a preferred embodiment of my invention it is to be definitely understood that I do not desire to limit the application of the invention thereto, and any change or changes may be made in the ingredients and in the manner in which the same are assembled together, within the spirit of the invention and the scope of the subjoined claims.

What is claimed is:

1. A magnetically responsive fluid of the character described, said fluid comprising approximately from 2 to 14 percent by volume of steel dust, 3 percent by volume of powdered graphite, and from 83 to 95 percent by volume of quicksilver.

2. A magnetically responsive fluid of the character described, said fluid consisting of substantially 14% by volume of steel dust, 3% by volume of powdered graphite, and 83% by volume of quicksilver.

3. A magnetically responsive fluid comprising the resultant of a mixture of substantially 2% by volume of steel dust, 3% of powdered graphite, and 95% mercury.

4. A magnetically responsive fluid comprising the resultant of a mixture of substantially 7% by volume of steel dust, 3% of powdered graphite, and 90% of mercury.

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