A. B. HENDRICKS, Jr.

ELECTRICAL TESTING APPARATUS.

APPLICATION FILED APR. 9, 1915.

1,215,150. Patented Feb. 6, 1917.

Fig. 1.

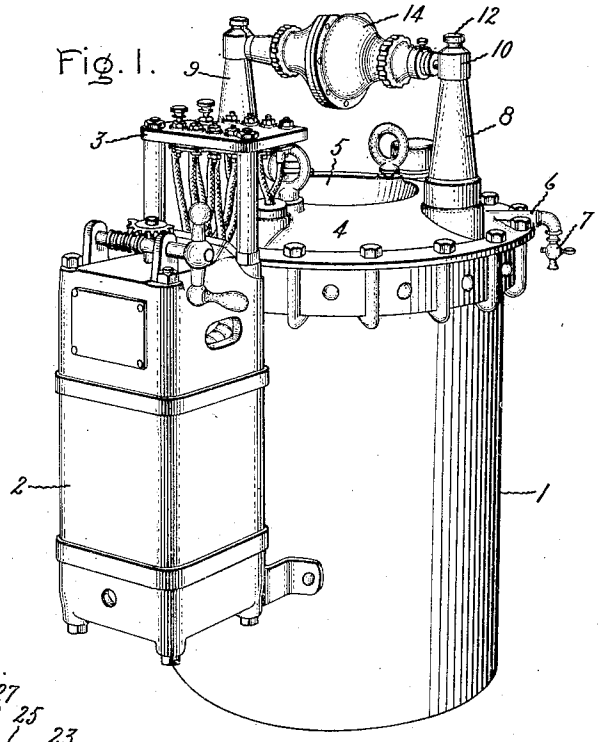


Fig. 3.

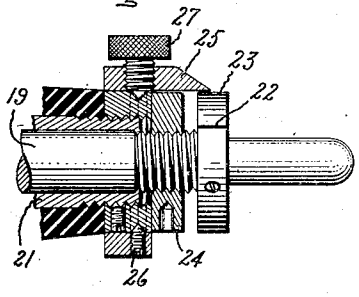
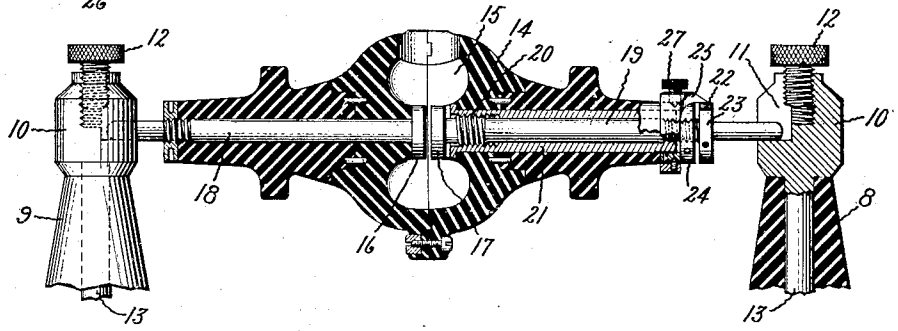


Fig. 2.



Witnesses:

George W. Tilden

J. Ellis Glen.

Inventor:

Allan B. Hendricks Jr.,

by Allan B. Davis

His Attorney,

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ALLAN B. HENDRICKS, JR., OF PITTSFIELD, MASSACHUSETTS, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

ELECTRICAL TESTING APPARATUS.

1,215,150. Specification of Letters Patent. Patented Feb. 6, 1917.

Application filed April 9, 1915. Serial No. 20,220.

To all whom it may concern:

Be it known that I, ALLAN B. HENDRICKS, Jr., a citizen of the United States, residing at Pittsfield, in the county of Berkshire, State of Massachusetts, have invented certain new and useful Improvements in Electrical Testing Apparatus, of which the following is a specification.

My invention relates to machines for testing electrical properties, particularly those of oils and other liquids. The objects of my invention are to improve devices of this kind so that the tests may be carried out expeditiously and whereby requisite adjustments of wearing parts may be readily made to secure continuously accurate results. The novelties of my invention relate particularly to the means for handling the liquids tested and the adjustments of the spark gap, as are more particularly pointed out in the following detailed description of a liquid testing outfit and in the appended claims.

In the accompanying drawing Figure 1 is an elevation of a complete liquid testing device embodying my invention; Fig. 2 is a sectional view of the spark gap thereof; and Fig. 3 is a detail of the adjustment for the spark gap.

In Fig. 1 the source of electrical energy for the testing spark gap is represented by the tank 1 which may contain any source of electric energy as a transformer. Attached to this tank is a regulator 2, shown here as a regulator of the induction type; its purpose is to vary the voltage as may be necessary in testing. The terminal board 3 provides for the connections to and from the source of energy and allows such changes thereof as may be necessary. The tank 1 is provided with a cover 4 which is provided with a recess 5 near its center. This recess is provided with the pipe 6 and valve 7 through which it may be emptied. At opposite sides of the recess are vertical standards 8 and 9 of insulating material. These vertical standards are provided with metallic caps 10, each of which contains an elongated cavity 11 extending in a generally vertical direction. Each of these caps 10 is also provided with a binding screw 12. The metallic caps 10 are connected through the rods 13 to the terminals of the source of energy as the secondary winding of the transformer.

The receptacle 14 for the liquid to be tested is rotatable in the standards 8 and 9. This receptacle is generally a casing of insulating material as hard rubber provided with a cavity 15 containing the spark gap terminals 16 and 17. The terminal 16 is carried by a fixed rod 18. The terminal 17 is carried by a rotatable rod 19, screw threaded at 20 in the body of the receptacle. For mechanical reasons a metallic sleeve 21 is preferably employed, tightly fixed in the main portion of the receptacle 14 and provides the screw threads coöperating with the threads on the rod 19.

The two rods 18 and 19 are designed to carry the receptacle; they extend in generally opposite directions therefrom and in practice rest in the cavities of the standards 8 and 9 to carry the receptacle 14.

The rod 19 is provided at its outer end with an index 22 on a disk 23 firmly fixed to the rod. Between the disk 23 and receptacle 14 the rod 19 is provided with screw threads for a lock nut 24. A zero index member 25 coöperating with the index 22 is carried by and rotatable about the adjacent end of the receptacle 14. This zero index member 25 carries pins 26, the inner ends of which traverse an annular groove in the receptacle 14 and prevent the removal of the index from the receptacle. The index member 25 is also provided with a locking screw 27, the inner end of which also runs in the annular groove of the receptacle. When this screw is loosened the indexing member 25 may be rotated at will and by the screw 27 may be fixed in any one of its angular positions about the end of receptacle 14.

The operation of this device is as follows: Prior to testing a sample of liquid the distance between the spark gap terminals 16 and 17 is adjusted to a desired value. This is done by loosening the lock nut 24 and rotating the rod 19 until the terminals 16 and 17 engage each other. The zero indexing member 25 is then adjusted until it registers with the index 22 on the disk 23 and the screw 27 is tightened, thereby fixing the zero index 25 in position. The rod 19 is then rotated in the reverse direction; the number of rotations being determined by the number of times the index 22 is carried past the index 25. Knowing the pitch of the screw threads at 20 any desired distance between the terminals 16 and 17 may thus be accurately obtained within the range of the apparatus. When the terminals have

been separated to the required distance the lock nut 24 is tightened and the receptacle is placed in the standards in the upright position shown in Figs. 1 and 2. The dimensions of the cavities 11 and the heads of the screws 12, and the lengths of the rods 18 and 19 are such that the receptacle may not be removed or placed in position without removing, or at least loosening one of the terminal screws 12. A sample of the liquid to be tested is poured into the cavity 15. Through the regulator 2 the voltage between the terminals 16 and 17 then is raised until a spark passes between the terminals. The value of this voltage may be determined in a variety of well known ways; after the circuit to the spark gap is opened, the receptacle 14 is rotated through approximately 180° and the liquid sample tested is poured into the recess 5 in the member 4. When the receptacle is again returned to its original position it is ready for a second test if the spacing between the terminals is suitable; it will be apparent from this that a number of tests may be made most expeditiously, one after the other, on as many samples of liquid. When the receptacle 5 is filled or after a sufficient number of tests have been made, the liquid in the recess may be withdrawn through the pipe 6 and the valve 7.

Due to variations more or less minute, occurring in the manufacture and assembly of the device and arising during its life, the zero index would at times be found out of register with the index 22 when the terminals 16 and 17 are brought into engagement. For this reason I have made this indexing member 25 adjustable, for through its adjustability it may be made to register with the index 22 when the terminals 16 and 17 are brought into engagement no matter what position this index 22 may assume. This lends accuracy to the adjustment of the spacing between the terminals 16 and 17 and tends to bring accurate results from the apparatus.

While I have described the principle of my invention and the best mode I have contemplated for applying this principle, other embodiments will occur to those skilled in this art and I aim in the appended claims to cover all embodiments which do not depart from the spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States, is:—

1. In a liquid testing outfit, a liquid testing spark gap comprising a rotatable casing provided with a cavity open at one side for the liquid to be tested and spark gap terminals within the cavity.

2. In a liquid testing outfit, a liquid receptacle comprising a rotatable casing provided with a cavity open at one side for the liquid to be tested and means within the cavity for testing the liquid therein.

3. In a liquid testing outfit, the combination of upright standards, electrically conducting means carried thereby, and a liquid testing receptacle comprising a rotatable casing provided with a liquid containing cavity open at one side, means within the cavity for testing the liquid therein, and means for carrying the liquid receptacle on the standards and for electrically connecting the testing means of the receptacle with the conducting means of the standards.

4. In a liquid testing outfit, the combination of a source of energy, a liquid testing receptacle comprising a rotatable casing provided with a liquid containing cavity open at one side and means within the cavity for testing the liquid therein, and standards carried by the source of energy and carrying said receptacle at a distance therefrom.

5. In a liquid testing outfit, the combination of a source of energy, a cover therefor provided with an upwardly opening recess, upright standards carried by said source of energy at the sides of said recess, electrically conducting means electrically connected to said source of energy and carried by said standards, and a liquid testing receptacle comprising a rotatable casing provided with a liquid containing cavity open at one side, means within the cavity for testing the liquid therein and means for carrying the liquid receptacle on the standards immediately over the recess in the cover and for electrically connecting the testing means of the receptacle with the conducting means of the standards.

6. In an electrical testing outfit, the combination with two upright standards each provided with an electrically conducting portion having an elongated cavity, the two cavities opening toward each other, of a liquid receptacle between said standards comprising two spark gap terminals, a fixed metallic rod carrying one of said terminals, a rotatable rod screw threaded into said receptacle and carrying the other of said terminals, and means for indicating the extent of rotation of said rotatable rod, the rods extending from opposite sides of and carrying the receptacle and resting in the cavities of said conducting portions of said standards.

In witness whereof, I have hereunto set my hand this 7th day of April, 1915.

ALLAN B. HENDRICKS, Jr.

Witnesses:
JOHN A. CHESNEY,
A. K. NUGENT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."