Dec. 10, 1957 G. GREIF 2,816,255

MOVING COIL SYSTEM WITH MAGNETIC CORE

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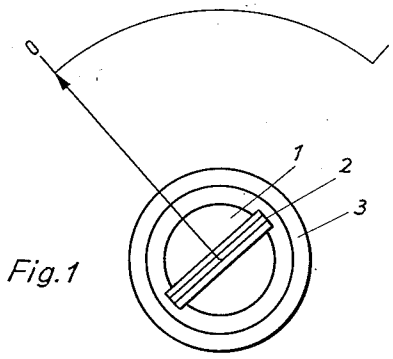
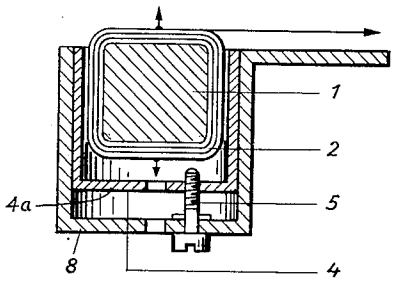


Fig.1

Fig.2



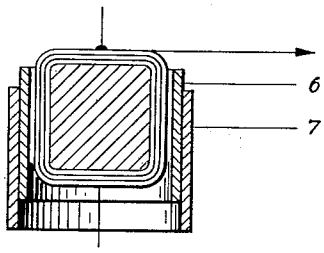


Fig.3

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MOVING COIL SYSTEM WITH MAGNETIC CORE

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4 Claims. (Cl. 317—166)

The general object of the present invention is to provide means for regulating or adjusting an electrical instrument based on the interaction of a moving coil system with magnetic core. These systems are equipped with a core of magnetic material. The core is surrounded by a moving coil, the latter and the core being enveloped by a cylinder of soft iron serving as magnetic short circuit. The core is magnetized in the direction of a diameter.

The special object of the present invention is to provide an arrangement for modifying the strength of the magnetic field of the core acting on the moving coil. Thereby the sensitivity of the instrument is influenced, thus facilitating its adjustment to the desired value. It is the purpose of this invention to enable such an adjustment which acts steadily on the whole range of deflection of the moving coil instrument, being simple in construction and easy to handle. The invention is explained by the following drawings:

Fig. 1, top view of a moving coil system with magnetic core.

Fig. 2, side view of a moving coil system according to the invention (sectional view).

Fig. 3, a special design of the invention.

In Figure 1 the core of magnetic material is marked with 1. 2 stands for the moving coil and 3 for the cylinder of soft iron surrounding the core and the moving coil.

In Figure 2 the core is again marked with 1 and the moving coil with 2. The cylinder of soft iron surrounding the core and the moving coil is provided with a frontal area, or end portion 4*a*, thus forming a pot 4. Pot 4 is disposed in another pot 8 of non-magnetic material, so as to be able to slide in it in the direction of its own axis. By turning screw 5 protruding into a threaded hole of the frontal area of pot 4, the latter is moved in the direction of its axle. As a consequence of this procedure, core 1 protrudes more or less from pot 4. The field originating from the protruding part of core 1 has no magnetic short-circuit and for this part the field acting on coil 2 is decreased as compared with that part with the magnetic short circuit. This decrease is the same for the whole range of deflection of moving coil 2. When moving pot 4, it is therefore possible to vary the field acting on coil 2 and to adjust the sensitivity of the moving coil system.

Also the external cylinder 8 can be made of soft iron. In this case a larger air gap and also a decrease of the field are produced when turning the part 4 at that spot where the core protrudes from part 4.

Another arrangement is shown by Figure 3. This construction provides for a fixed internal magnetic short-circuit cylinder 6 of soft iron, whereas an external magnetic short-circuit cylinder 7 can be moved axially against the internal cylinder. The cylinder 6 is so thin that it is oversaturated by the magnetic field produced by the core. Therefore in that part where cylinder 6 protrudes from cylinder 7, part of the lines of force pass through cylinder 6. There is a decrease of the field as compared to those parts where cylinders 6 and 7 overlap, for the lines of magnetic force passing through cylinder 6 are absorbed by cylinder 7, the latter being so strong that an oversaturation will not be produced.

I claim:

1. An electrical measuring system including a transversely magnetized cylindrical core, a cylindrical soft iron flux-path piece surrounding said core and spaced therefrom by a radial air gap, a coil surrounding said core with parts of the coil windings lying within said air gap, the coil being pivotally mounted for angular movement about an axis extending through said core; means for relatively displacing the said piece with respect to the magnetic core in a direction parallel with the axis of the magnetic core for adjusting the sensitivity of the measuring system.

2. An electrical measuring system including a transversely magnetized cylindrical core, a cylindrical soft iron flux-path piece surrounding said core and spaced therefrom by a radial air gap, a coil surrounding said core, parts of the coil windings lying within said air gap, the coil being pivotally supported for angular movement about an axis extending through said core; a non-magnetic bearing member in which the piece is mounted for displacement in direction of the axis of the magnetic core, said piece having an end portion; a controlling member provided in said bearing member and engaged with said end portion for realizing the desired displacement of the iron yoke relative to the magnetic core.

3. An electrical measuring system including a transversely magnetized cylindrical core, a first cylindrical soft iron flux-path piece surrounding said core and spaced therefrom by a radial air gap, a coil surrounding said core parts of the coil windings lying within said air gap, the coil being pivotally mounted for angular movement about an axis extending through said core; a second cylindrical soft iron flux-path piece coaxially surrounding said first cylindrical soft iron yoke, one of said cylindrical soft iron pieces being mounted for displacement in direction of the axis of the magnetic core.

4. An electrical measuring system as claimed in claim 3, the displaceable cylindrical piece having a frontal area; and a controlling member being provided on said other cylindrical piece for acting upon the frontal area of the first named cylindrical piece in the sense of the desired displacement.

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