March 4, 1930. J. ZUBATY 1,749,366

AMMETER MAGNET

Filed July 20, 1927

Fig 1

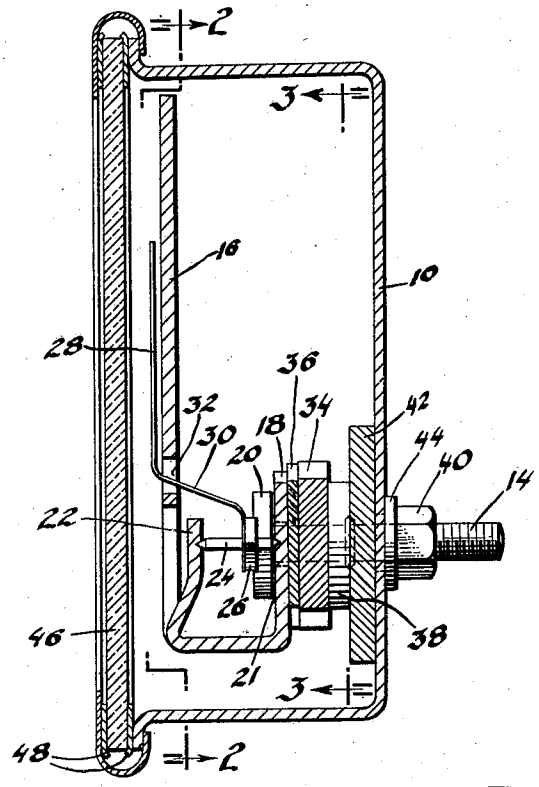



Fig 2

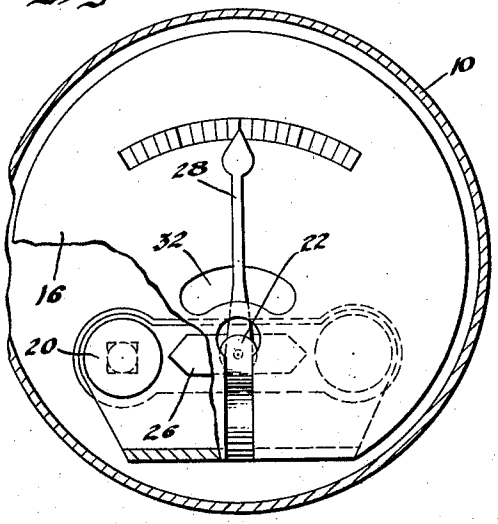
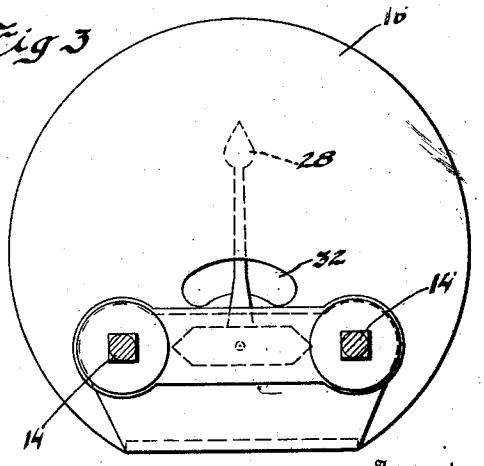



Fig 3

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Patented Mar. 4, 1930 1,749,366

# UNITED STATES PATENT OFFICE

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## AMMETER MAGNET

Application filed July 20, 1927. Serial No. 207,265.

This invention relates to ammeters and more particularly to ammeters of the type ordinarily provided on the dash-board of an automotive vehicle to indicate the magnitude and direction of the current through the electrical system.

In ammeters of the present type, simplicity is the cardinal requirement. This is necessary in the interests of long life and good service and in economy in manufacturing and assembling. Ammeters of this type are ordinarily mounted in a small case and include a conductor of the current to be measured, a permanent magnet, a pivoted indicating needle carrying an armature of magnetic material, and a dial. It is an object of the present invention to simplify the structure by eliminating a hitherto necessary part. I accomplish this result by having the magnet carry the current to be measured.

Other objects of the invention will appear in the course of the following description, taken in connection with the accompanying drawing and appended claims.

In the drawing:

Figure 1 is a vertical longitudinal section.

Figure 2 is a section on the line 2—2 of Figure 1, with parts broken away.

Figure 3 is a section on the line 3—3 of Figure 1.

Referring to the drawing, the numeral 10 indicates the usual cup-shaped case, flanged at its rim and provided in its rear face with spaced apertures for the terminal bolts 14. The numeral 16 indicates the metallic non-magnetic dial which has a reversely bent portion or finger 18 underlapping the dial and apertured for fitting under the heads 20 of the terminal bolts 14. The face or outer portion of the dial is bent rearward at its edge to form a tongue 22. Supported in prick punched bearings in the parts 18 and 22 of the dial is a pointer swinging mechanism comprising the shaft 24 on which is mounted an armature 26 of magnetic material, and the indicating needle 28. The needle 28 is provided with an offset portion 30 extending through the arcuate slot 32 in the dial. The shaft 24, armature 26 and needle 28 rotate as a unit.

The numeral 34 indicates the permanent bar magnet provided with apertures for the terminal bolts 14. A strip 36 of insulating material is placed between the magnet 34 and the rear portion 18 of the dial. The numeral 21 indicates insulating washers between the dial and the terminal bolts. The portion 18 of the dial, insulating strip 36 and magnet 34 are held together by washers or nuts 38 screwed or otherwise fixed on the bolts 14. This unitary structure is fixed to the case by means of nuts 40, being spaced therefrom by an insulating strip 42 and insulating washers 44. The usual glass cover 46 and bezel 48 are provided to make the case dustproof.

The operation of the device is as follows: The permanent magnet 34 normally holds the armature 26 in the position illustrated. When a current passes through the magnet, the magnetic flux about the magnet resulting from the passage of the current tends to swing the armature to a position at right angles to its illustrated position. The direction and magnitude of the deflection is dependent on the direction and magnitude of the current through the magnet. With a good steel magnet, the strength of the permanent magnet will remain unaffected.

I claim:

1. In an ammeter, a conductor comprising a permanent magnet, a dial insulated from said conductor, terminals, common means for uniting said dial, magnet and terminals, an oppositely disposed finger and a tongue on said dial, and a pointer swinging mechanism mounted on said finger and tongue.

2. In an ammeter, a conductor, terminals therefor, a dial, a finger connected with said dial and placed in juxtaposed relation to said conductor and terminals, said terminals passing through openings in said finger and conductor to secure said terminals to said conductor and finger, means for insulating said dial from said terminals and said conductor, and a pointer swinging mechanism mounted between said finger and dial.

3. In an ammeter, a dial, a finger integral

with said dial and bent to underlap the same, electric terminals connected to said finger, a conductor comprising a permanent magnet directly connected to said terminals, and a pointer swinging mechanism mounted between said finger and dial.

In testimony whereof I affix my signature.

JOSEPH ZUBATY.