April 11, 1961 DE WITT T. VAN ALEN 2,979,258

INDICATING DEVICE

Filed July 20, 1955

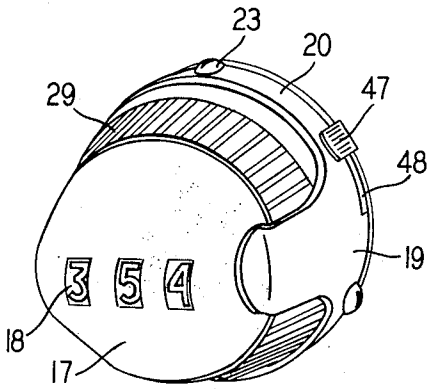


Fig. 1

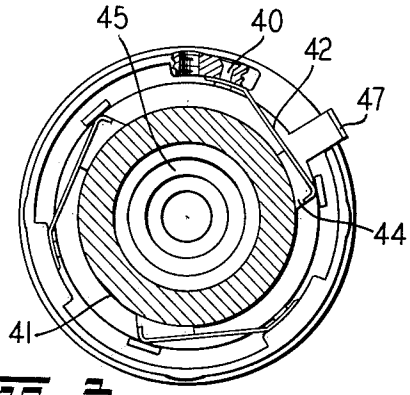


Fig. 3

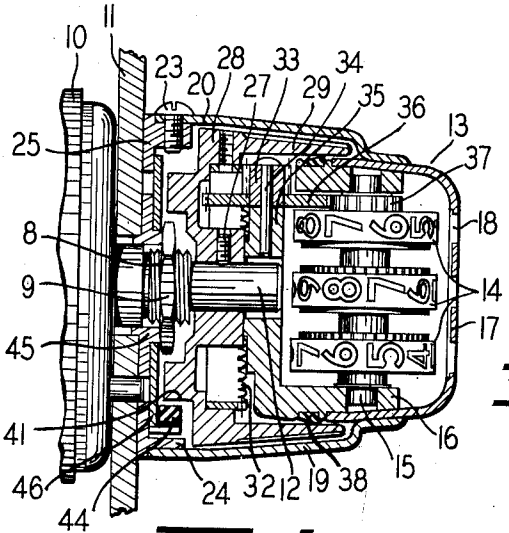


Fig. 2

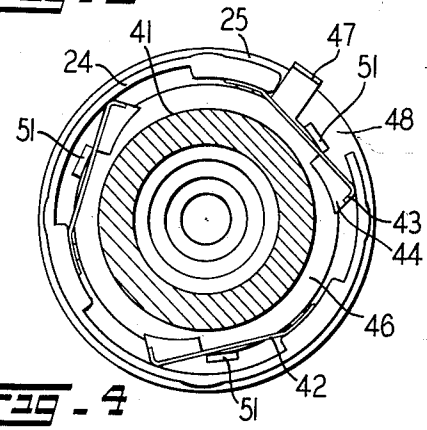


Fig. 4

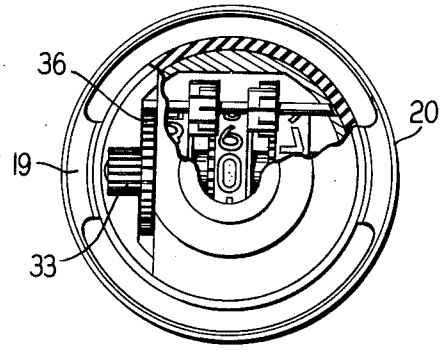


Fig. 5

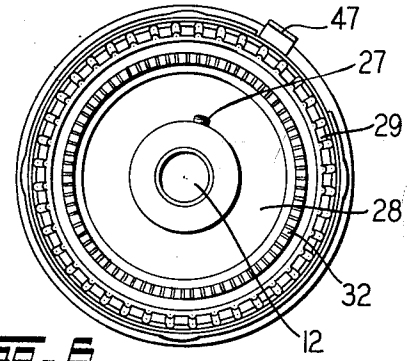


Fig. 6

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INDICATING DEVICE

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3 Claims. (Cl. 235—103)

This invention relates to an indicating device which is direct reading.

The device of the present invention includes a multi-wheel direct reading counter and a knob adapted to control the rotation of a shaft, such as the shaft of the potentiometer shown in my prior Patent No. 2,665,355, although the dial is adapted for connection to a variety of rotary devices. In the device of the present invention the knob transmits rotary motion both to the controlled shaft and to the counting wheels which register the extent through which the shaft has rotated.

The invention resides in my novel means for mounting the counting wheel capsule from a panel surface, such mounting being independent of the motion transmitting connections between the device knob and the shaft of the controlled device with which the knob is coaxial. Accordingly, my device is readily applied to the projecting shafts of potentiometers, etc., there being no need to support the device on the shaft.

In the foregoing respect my device is unlike prior art direct reading dials known to me in which the counting capsule is fixedly mounted to a fixed projecting stem, motion from the knob being communicated to the controlled device via auxiliary means.

The device of my invention is dustproof and is provided with a brake to hold the controlled shaft positively in any position of adjustment. The brake is specifically constructed to apply braking pressure without developing any rotary pressure on the shaft. Accordingly, the shaft adjustment is not changed in the course of setting the brake.

In the drawings:

Fig. 1 is a perspective view of a direct reading device embodying my invention.

Fig. 2 is a vertical cross section, partly in elevation, taken through the device of Fig. 1.

Fig. 3 is a disassembled elevation of the brake shoe retaining ring, a brake surface portion of the knob rotor being shown in cross section.

Fig. 4 is a view similar to Fig. 3 showing the brake shoes in released position.

Figs. 5 and 6 are right and left hand views respectively of the device opened up to expose details, parts of Fig. 5 being shown in cross section and other parts being broken away.

The potentiometer **10** or similar controlled rotary device may be mounted on a panel **11** with its operating shaft **12** extending forwardly therefrom. The nut **9** clamps the threaded potentiometer sleeve **8** to the panel for mounting purposes. The knob **29** of the direct reading device of the present inveniton is connected directly to the operating shaft **12**, the counting capsule **13** of my device being supported on the panel **11** and independently of shaft **12**.

The counting capsule **13** is conventional and may comprise multiple counter wheels **14** which rotate on the axis of mounting shaft **15** which has bearings in suitable sockets in the capsule housing **16**. The capsule is

provided with the usual gearing to actuate the wheels, and has a cover **17** with windows **18** through which the numbered counting wheels are visible. The capsule housing **16** is fixedly supported on legs **19** which merge with a mounting ring **20** releasably secured by bolts **23** to the peripheral flange **24** of a mounting plate **25**. The mounting plate **25** is fixedly secured to panel **11** by the clamping pressure of nut **9**. Accordingly, the counting capsule **13** is rigidly supported on its legs **19** from the panel **11** and is non-rotatable with respect thereto.

Within the legs **19**, and mounted by set screw **27** to the shaft **12**, is a hollow dial rotor **28** having an outer knob surface **29** exposed for finger manipulation except where covered by the legs **19**. The knob **29** is hollow to receive motion transmitting gearing hereafter described.

The dial rotor **28** is provided with a crown or ring gear **32** with which pinion **33** meshes. Pinion **33** is free to turn on stub shaft **34** extending radially from the hub **35** of the counting capsule housing. Pinion **33** carries a gear **36** which meshes with the input gear **37** of the counting wheel mechanism.

Accordingly, if the knob **29** is rotated the crown gear **32** will rotate pinion **33** about the axis of shaft **34**. This rotative movement will be communicated by gear **36** to the input gear **37** of the counting capsule to rotate the counting wheels **14** in the conventional manner.

The hollow knob **29** and capsule housing **16** interfit with reasonably close tolerance, an elastic dust seal **38** being mounted therebetween to exclude dust from entering the gearing and other moving parts.

From the foregoing it is clear that the device of the present invention is characterized by its novel structure in which the counting capsule **13** is supported on panel **11** by legs **19** which are radially outwardly offset from the knob **29**. This construction permits direct connection between the shaft **12** and the knob **29** which are free to rotate within the embrace of legs **19** and substantially eliminates backlash between the knob and shaft.

The rotor **28** is provided with an annular braking surface **41** which is radially inwardly adjacent brake shoes **44** mounted on spring arms **42**. The spring arms **42** are connected by rivets **40** to the flange **24** of the mounting ring **25**. The ends of the spring arms **42** are turned at **43** and desirably integrally bonded to the brake shoes **44** which are desirably made of Neoprene rubber.

Rotatively mounted on the central flange **45** of the plate **25** is an annular cam ring **46** having a handle **47** which extends through a slot **48** in flange **24**. The cam ring **46** is provided with projecting cam lugs **51**. Rotative movement of the cam ring in a clockwise direction, as shown in Fig. 4, will move the lugs **51** against the spring arms **42** to cam the brake shoes **44** radially inwardly against the braking surface **41** formed on the dial rotor **28**. Accordingly, the knob and shaft can be locked in any adjusted position.

I desirably provide three brake shoes **44** in order to equalize the pressure thereof in positive bearing engagement with the brake surface **41**. The geometry of the braking device is such that spring arms **42** are at right angles to radii passing through the brake shoes **44** when the shoes engage the braking surface **41**. Accordingly, the movement of the brake shoes **44** toward pressure engagement with the braking surface **41** is entirely radial and there is no tangential or other non-radial component of force tending to oscillate the knob on its axis of rotation. For this reason the dial may be locked without danger of even the slightest change in reading attributed to actuation of the braking mechanism.

I claim:

1. An indicating device adapted to be mounted on a panel and connected to the shaft of a rotary instrument,

said device comprising a mounting plate, means for fastening said plate to the panel, at least one leg extending from the margin of said plate, a counter having at least one numbered element mounted on said leg, a hollow knob surrounding the shaft and offset radially within said leg for relative rotation of the knob with respect to the leg, means directly connecting said knob to the shaft and motion transmitting gearing within said knob interconnecting the knob and numbered element for rotation of said numbered element on rotation of the knob.

2. The device of claim 1 in which said knob is provided with a braking surface, in further combination with a brake and means for selectively applying said brake to said surface and releasing said brake from said surface.

3. The device of claim 2 in which said brake comprises a plurality of brake shoes and arms on which said shoes are radially movable with respect to said braking surface, said means comprising a cam ring and cam lugs mounted thereon, said ring being mounted for rotation on a path of engagement of said cam lugs against said brake.

References Cited in the file of this patent

UNITED STATES PATENTS

2,119,576	Goldstine	June 7, 1938
2,532,970	Van Dyke	Dec. 5, 1950
2,685,944	Faucher et al.	Aug. 10, 1954
2,777,637	Matthew	Jan. 15, 1957