

UNITED STATES PATENT OFFICE.

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REGISTER.

SPECIFICATION forming part of Letters Patent No. 657,578, dated September 11, 1900.

Application filed June 11, 1900. Serial No. 19,929. (No model.)

To all whom it may concern:

Be it known that I, CHARLES FREDERIC JULIAN WERNERT, a citizen of the United States, residing at Evansville, in the county of Vanderburg and State of Indiana, have invented a new and useful Register for Gas-Meters, of which the following is a specification.

This invention relates to gas-meters in general, and more particularly to the registering or indicating mechanism thereof, the principles involved being applicable, however, to registers or indicators used upon water-meters, &c.

One object of the invention is to provide a simple and efficient construction in which the state of the meter will be clearly and accurately shown and in which, furthermore, the parts will be held against retrograde movement.

Additional objects of the invention will be evident from the following description.

In the drawings forming a portion of this specification, and in which like numerals of reference indicate similar parts in the several views, Figure 1 is a plan view of the mechanism detached from the meter. Fig. 2 is a section on line 2 2 of Fig. 1. Fig. 3 is a perspective view showing the escapement-bar. Fig. 4 is a perspective view of a modification.

Referring now to the drawings, the mechanism is carried by a rectangular frame including sides 5 and 6 and ends 7 and 8, the latter being connected by an intermediate plate 9.

The drive-shaft 10, which is connected directly with the main shaft of the operating mechanism of the meter, (not shown,) is journaled in bearings in plates 5, 6, and 9 and carries a pinion 17. A cam 11, forming one element of an escapement mechanism hereinafter described, is mounted loosely upon a shaft 10^a, journaled in plates 6 and 9, the cam being fixed to a gear-wheel 12, which is also loose upon the shaft, or both the gear-wheel 12 and the cam may be fixed upon the shaft. The gear-wheel 12 meshes with a pinion 13 upon a second shaft 14, which is mounted in plates 6 and 9 and connected with which is a gear-wheel 15, which meshes with the pinion 17 upon the shaft 10, whereby the cam may

be rotated from and at a lower speed than the shaft 10.

Journaled in the plates 9 and 5 are a plurality of shafts 18, 19, 20, and 21, which in the present instance are four in number, although it will be seen from the following description that any suitable number may be used, and each of these shafts carries a dial-plate 22, each having a series of figures marked upon its face and which are adapted to pass successively into view before an opening 24 in the plate 5, (shown in dotted lines,) this construction being preferable to the employment of hands that are liable to become broken. The shafts are adapted for step-by-step rotation to expose the figures carried by the dial-plates 22, each of said shafts 18, 19, 20, and 21 being rotated one step for each complete rotation of the preceding shaft named. This rotation of the several shafts is accomplished by engagement of knife-edges with star-wheels fixed upon the shafts, one movement of a knife-edge in engagement with a wheel acting to move that wheel and its shaft one step.

The escapement mechanism comprises a bar 35, having guide-rods 36, which slidably engage guides upon the plate 9 and which rod lies between said plate 9 and the gear-wheel 12. Upon the rod or bar 35 are fixed a series of rods 37, corresponding in number to the shafts 18, 19, 20, and 21, and which rods carry laterally-extending knife-edges 38 at their upper ends, which project over escapement-wheels 39, which are fixed upon the said shafts. The knife-edges are held at times away from the escapement-wheels by means of the bar 35, which has a finger 40, disposed to ride upon the cam 11.

It will be noted that each of the escapement-wheels has one face of each tooth radially of the wheel and the other face at an acute angle thereto, and these wheels stand normally with the radial faces of their uppermost teeth vertical, so that as the knife-edges are raised and lowered, due to the action of the cam, the knife-edges will normally be inactive with respect to the escapement-wheels. If, however, any one or more of the wheels be slightly moved while the knife-edges are raised, so as to take the points of

the uppermost teeth beyond the knife-edges, then said knife-edges when they descend will strike on the oblique faces of the teeth of the escapement wheel or wheels and the latter
 5 will be moved one step. It will be noted that the knife-edges are formed each with a vertical face and an oblique face, to facilitate this operation.

In order to advance the escapement-wheels
 10 for engagement by the knife-edges, the shafts 18, 19, 20, and 21 have disks 25, 26, 27, and 28 fixed thereon, respectively, and occupying parallel planes spaced differently from plate 5 of the frame of the mechanism. The disks
 15 25, 26, and 27 have each a series of pins 29 in one face and adjacent the edge thereof, while each of the disks 26, 27, and 28 has a radial finger 30, which as the disks are rotated engage the pins of the corresponding
 20 disks. Thus when the disk 28 is rotated once its finger 30 engages a pin 29 upon disk 27 and moves said disk one step, the disk 27 remaining stationary until the disk 28 has made one complete rotation, when the finger 30 en-
 25 gages a second pin and again moves the disk 27. This movement of the disk 27 is just sufficient to move its star-wheel or escapement-wheel from the position shown in Fig. 2 to a position where its corresponding knife-edge
 30 will strike the oblique face of the wheel, as above mentioned. Thus while the fingers 30 start the escapement-wheels the knife-edges actually turn them. When the disk 28 has rotated a number of times corresponding to
 35 the pins upon disk 27, said disk has been rotated once, and its finger 30 will then engage one of the pins 29 upon disk 26 to advance said disk in the same manner and for the same purpose. The disk 28 is rotated by reason of
 40 a pin 31 upon the gear-wheel 12 engaging a star-wheel 32 upon shaft 21 once during each rotation of said wheel 12. It will thus be seen that by placing the proper numbers of pins upon the several disks and by properly num-
 45 bering the dial-plates which rotate therewith the number of rotations of the shaft 10 may be indicated, and therewith the quantity of the fluid that is to be measured may be determined.

50 It will thus be seen that with the mechanism shown and described there is provided an efficient registering device, and it will be noted that the escapement mechanism has also the function of preventing return move-
 55 ment of the dials and consequent error.

It will be understood that in practice various modifications of the specific construction shown may be made and that any suitable materials and proportions may be used

for the various parts without departing from 60 the spirit of the invention.

In Fig. 4 of the drawings there is shown a modification showing a spider having an up-
 turned end that might be substituted for the disks with pins thereon, the upturned end 65 engaging between the legs of the spider at each rotation.

What is claimed is—

1. In a register for meters, the combination of a drive-shaft and a plurality of dial-shafts, 70 of step-by-step mechanism for rotating the several shafts, one from another, escapement-wheels carried by the dial-shafts, and means operated from the drive-shaft for engagement with the escapement-wheels to hold the dial- 75 shafts against rotation when the step-by-step mechanism is inactive.

2. In a register the combination with a drive-shaft and a plurality of dial-shafts, of a step-by-step mechanism for rotating the 80 several shafts one from another, escapement mechanism carried by the dial-shafts, and means operated from the drive-shaft for engaging the escapement mechanism to hold the dial-shafts immovable when the escape- 85 ment mechanism is inactive.

3. In a register for meters, the combination with a drive-shaft and a plurality of dial-shafts, of an escapement-wheel upon each of the dial-shafts, means operated by the drive- 90 shaft for intermittent engagement with the escapement-wheels to hold the dials against movement at times, step-by-step mechanism operated from the drive-shaft for moving the dial-shafts when released by the escapement 95 mechanism, and ratchet mechanism cooperating with the escapement mechanism to hold the dials for oscillatory movement.

4. In a register for meters, the combination with a drive-shaft and a plurality of dial- 100 shafts having step-by-step operating means, of an escapement-wheel upon each of the dial-shafts, a reciprocatory bar having a plurality of knife-edges adapted for engagement with the escapement-wheels to hold them from ro- 105 tation in one direction, a cam upon the drive-shaft, an arm upon the rod engaging the cam to reciprocate the rod, and ratchet mechanism for holding the dial-shafts from move- 110 ment in a second direction.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

CHARLES FREDERIC JULIAN WERNERT.

Witnesses:

ALBERT T. WERNERT,
 A. M. PETERSON.