

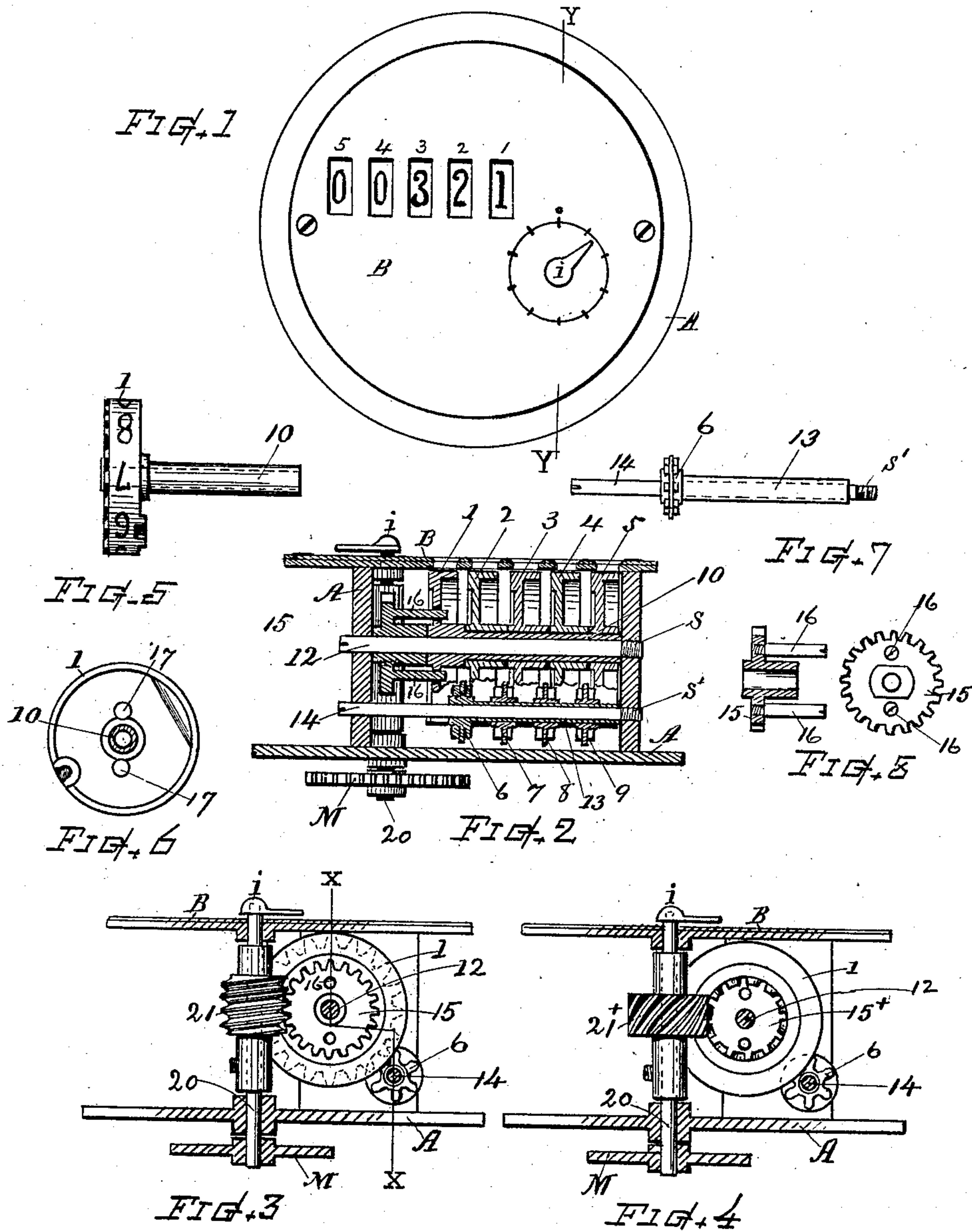
No. 760,001.

PATENTED MAY 17, 1904

W. H. LARRABEE.
METER REGISTER.

APPLICATION FILED JAN. 13, 1904.

NO MODEL.



Witnesses.
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METER-REGISTER.

SPECIFICATION forming part of Letters Patent No. 760,001, dated May 17, 1904.

Application filed January 13, 1904. Serial No. 188,898. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. LARRABEE, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Meter-Registers, of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

The object of my present invention is to provide a construction in straight-reading registers whereby without employing springs the gears and pinions of the figure-wheels will be caused to move up into position in a manner to give a straight alinement of the figures when making the decimal changes without showing the usual backward drag or variations due to the backlash and looseness of the gearing.

Another object is to provide a construction of the nature described wherein the weight and wear of the moving parts is so distributed and provided for that the mechanism is rendered durable, easy running, and economical for manufacture.

I attain these objects by the peculiar construction and manner of combination herein-after explained, the particular subject-matter claimed being definitely specified in the summary.

In the drawings, Figure 1 represents a top view of a straight-reading meter-register. Fig. 2 represents a longitudinal vertical section through the figure-wheels and pinions at the line X X on Fig. 3. Fig. 3 represents a section at line Y Y on Fig. 1 looking toward the end of the figure-wheel train. Fig. 4 is a similar view with a modified gearing. Fig. 5 shows a separate side view of the first figure-wheel with its attached bearing-sleeve. Fig. 6 is an end view of the same. Fig. 7 is a side view of the first pinion with its attached sleeve and axis-shaft, and Fig. 8 shows a section and end view of the train head-gear.

The mechanism to which my invention is applied as an improvement is in its general

form and operation as a registering means arranged somewhat similar to prior registers of this class and will be understood without a full detailed description of previously-employed parts. It comprises a frame A, a series of figure-wheels 1 2 3 4 5, a series of pinions 6 7 8 9, means for operating the train from a prime mover, and a perforated face or escutcheon B, through which the figures are shown.

In accordance with my invention I provide the first figure-wheel 1 with a long tubular bearing or sleeve 10, rigidly fixed thereto, and said wheel, with its sleeve, is mounted to turn upon a stationary or non-rotatable rod or shaft 12, supported in the frames, while the succeeding figure-wheels 2 3 4 5 of the train are mounted to turn upon the exterior of the sleeve 10, said sleeve extending through the central openings of all said figure-wheels, as best shown in Fig. 2. In similar manner I provide the first pinion 6 with a long bearing-sleeve 13, fixed thereto and mounted to turn upon a stationary or non-rotatable shaft 14, fixed in the frame, and the several succeeding pinions are all mounted to turn upon the exterior of said sleeve 13. The ends of the shafts 12 and 14 are threaded and screwed into the end frame A, as at s s' , thus forming a firm construction with a comparatively small size of shaft.

The gear 15 at the head of the figure-wheel train is mounted loose upon the shaft 12 and is made separate from the figure-wheel, but is provided with means whereby it is inter-clutched to the first figure-wheel 1, as shown, by studs or pins 16, fixed to said gear and projecting through holes 17, formed in the web of the figure-wheel 1; but the gear and wheel are not rigidly connected to each other longitudinally and can be readily detached when the shaft 12 is removed by unscrewing its end at s .

An upright drive-shaft 20 is provided with a gear or worm 21, that meshes into the head-gear 15 for operating the figure-wheel train. The gears 15 and 21 when the mechanism is designed for registering cubic feet preferably

consist of a worm and worm-wheel, (see Fig. 3,) and when designed for registering gallons they preferably consist of a pair of spiral gears 15^\times and 21^\times . (See Fig. 4.) These two kinds
 5 of gears are made interchangeable, so that a meter-regulator mechanism can at any time be changed from a cubic-feet register to a gallons-register by taking out the worm-wheel 15 and worm 21 and replacing them with spiral
 10 gears 15^\times and 21^\times . This can be readily effected by unscrewing the shaft 12 at *s* and withdrawing it and the upright shaft, then interchanging the gears and reinserting the shafts.

15 Motion is imparted to the shaft 20 through the gear M on the end thereof, which gear receives motion from the water-meter mechanism in usual manner.

By providing the primary figure-wheel with
 20 a long sleeve-bearing and mounting the other figure-wheels thereon, while said sleeve is mounted on a fixed axial shaft, the weight and wear of the moving parts are more uniformly distributed. Also the friction and movement
 25 of the sleeve tends to carry all of the figure-faces up to a uniform straight alinement with each other when the decimal changes are effected and to retain them in such alinement by taking up all backlash in one direction of
 30 their movement, rendering the operation perfect without requiring springs for the several figure-wheels. My improved construction also renders the mechanism free and easy for operation and avoids liability of the sticking
 35 or setting of the bearing-joints by corrosion. By screwing the end of the shafts into the frame a firm and rigid construction is provided, and the shafts can be of smaller size than usual.

40 What I claim as of my invention, and desire to secure by Letters Patent, is—

1. In a register mechanism of the character specified, the combination, with the train of figure-wheels, its tubular bearing-sleeve, and
 45 non-rotatable main shaft secured in the frame and having said sleeve rotatable thereon; of a series of pinions wherein the first pinion of the series is provided with an integral or rigidly-attached tubular sleeve upon which the

other pinions of the series are rotatably and 50 severally mounted, a non-rotatable pinion-supporting shaft having said pinion-carrying sleeve rotatable thereon, a head-gear on the main shaft interlockingly connected with the first figure-wheel, and a drive-shaft and gear- 55 ing for operating said gear-head.

2. In a meter register mechanism of the class specified; the combination with the train of figure-wheels, and their axis-supporting shaft; of an unattached head-gear rotatably mounted 60 upon said shaft, and means for the detachable interclutching engagement of said gear with the first figure-wheel for effecting unitary rotative action thereof, substantially as set forth.

3. In a register of the class specified, the 65 combination with the train of figure-wheels, the first wheel having a bearing-sleeve upon which the other wheels are mounted, and provided with holes or lugs, a non-rotating supporting-shaft removably secured in the frame, 70 a detachable head-gear rotatably mounted on said shaft, and provided with projecting studs or pins that engage said figure-wheel, and means for rotating said head-gear, substantially as set forth. 75

4. In a meter registering mechanism of the character specified, the combination, with the train of figure-wheels and pinions, the first figure-wheel provided with an attached tubular sleeve on which the other figure-wheels are 80 rotatably supported, and a removable supporting-shaft therefor; of the head-gear independently mounted on said shaft, means for the detachable interclutching engagement of said head-gear with the first figure-wheel, a 85 removable upright drive-shaft, and a drive-gear detachably secured thereon that meshes with said head-gear; said mechanism being adapted for the interchange of worm-gears for spiral gears, or vice versa, as the head-gear 90 and drive-gear, substantially as and for the purpose set forth.

Witness my hand this 9th day of January, 1904.

WILLIAM H. LARRABEE.

Witnesses:

CHAS. H. BURLEIGH,
 ELLA P. BLENUM.