(No Model)

A. J. WILEY.

TAPE MEASURE.

No. 583,830. Patented June 1, 1897.

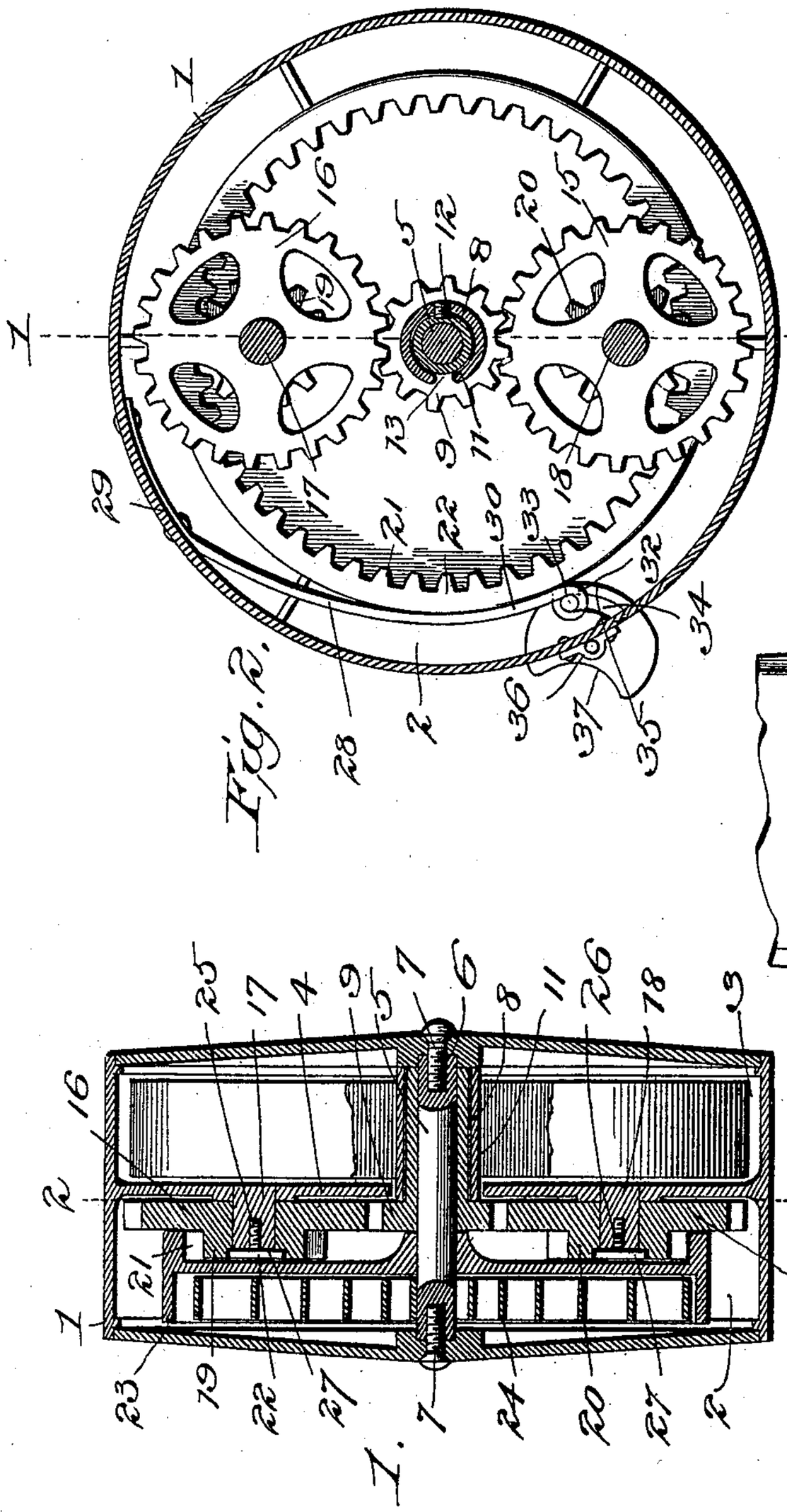

Fig. 2.

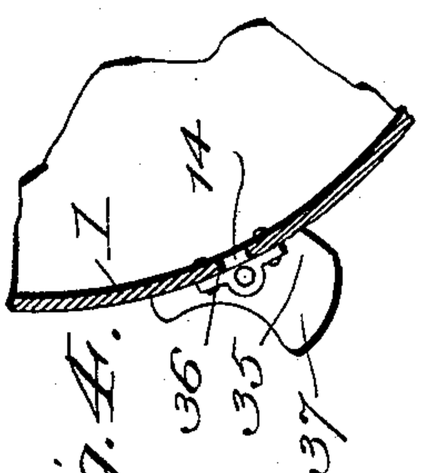

Fig. 4.

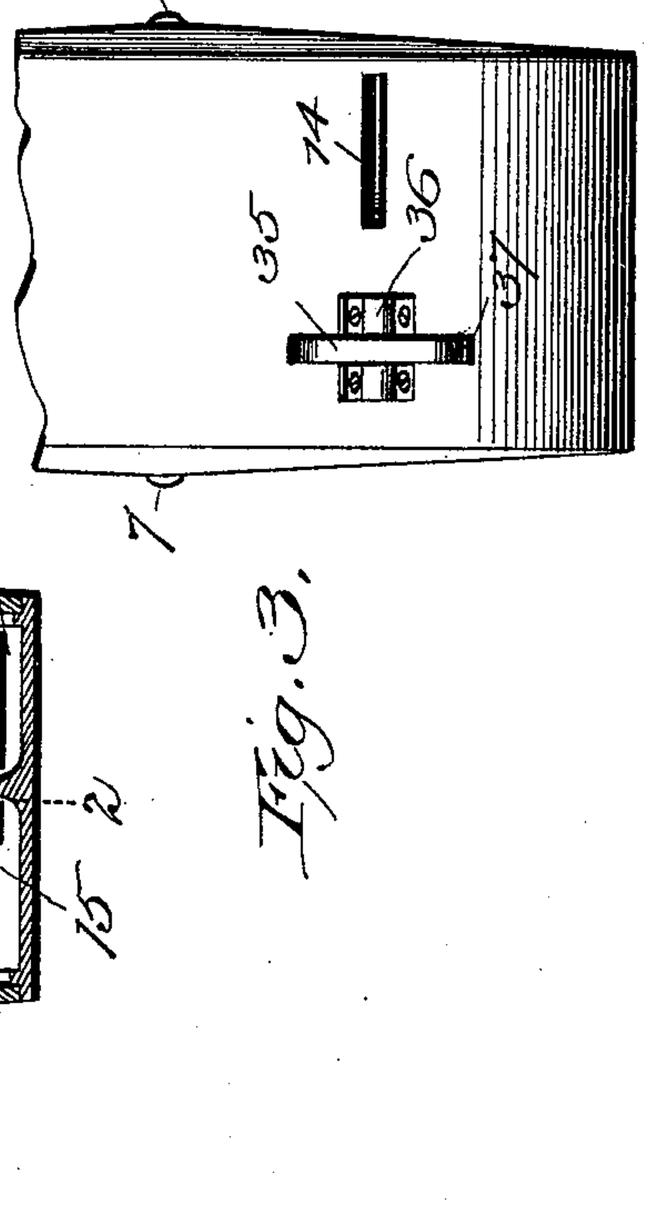

Fig. 3.

Fig. 1.

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UNITED STATES PATENT OFFICE.

ANDREW J. WILEY, OF GRAND VIEW, IDAHO, ASSIGNOR OF TWO-THIRDS TO GERALD F. SHERMAN, OF GRASS VALLEY, CALIFORNIA, AND ARTHUR B. FOOTE, OF BOSTON, MASSACHUSETTS.

TAPE-MEASURE.

SPECIFICATION forming part of Letters Patent No. 583,830, dated June 1, 1897.

Application filed October 3, 1896. Serial No. 607,814. (No model.)

To all whom it may concern:

Be it known that I, ANDREW J. WILEY, a citizen of the United States, residing at Grand View, in the county of Owyhee and State of Idaho, have invented certain new and useful Improvements in Tape-Measures; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements, as hereinafter set forth, in tape-measures, the invention, as will hereinafter appear, referring more especially to tape-measures of the self-winding character.

In the drawings, Figure 1 represents a section taken on the line 1 1 of Fig. 2. Fig. 2 represents a section, taken on the line 2 2 of Fig. 1, of my improved tape-measure, full size. Figs. 3 and 4 represent detail views of portions of the device.

1 represents the box or case, within which the tape and its supporting and operating mechanism are contained. This box may be of any suitable material and size and may be cast or otherwise formed. It is divided into two compartments 2 3 by a diaphragm 4, having transverse openings to receive and afford bearing for the several axes or spindles on which the tape carrying and operating mechanism are supported.

5 represents a central axis or spindle extending through the interior of the box and stationarily seated at its respective ends in recesses in the inner walls of the box and rigidly held therein with capability of ready removal by the threaded pins 7, passed through the box and engaging with threaded orifices in the ends of said axis.

8 represents a sleeve having loose rotatable bearing on the axis 5, and at one end extending through the diaphragm 4. On this projecting end of said sleeve is mounted a pinion 9, which, through the medium of spring-actuated gearing, to be presently described, meshing therewith, imparts rotary motion to said sleeve.

The tape which is contained in the compartment 3 may be of any suitable material. The inner end of said tape is connected with said sleeve in any suitable manner, as by a loop encircling said sleeve, and is frictionally held thereon by a second sleeve 11, in the form of a spring-clip, connected with said sleeve 8, so as to rotate in unison therewith, by a lug or key 12, projecting from the sleeve 8 and engaging in a recess in the outer sleeve 11. From the inner or main sleeve 8 the tape passes through a slot 13 in the outer sleeve, around which it is coiled, its outer end passing through a slot 14 in the case.

15 16 represent a pair of toothed gears intermeshing with the pinion 9 and journaled on a pair of short studs or axles 17 18, having rigid bearing in the central diaphragm 4. Either formed integrally with said gears 15 16, as shown, or separately therefrom, as desired, is a pair of small toothed gears or pinions 19 20, the teeth of which mesh with the inner circumferential teeth 21 of the large spur-wheel 22, journaled on the axis 5, and having a circumferential flange 23, within which is contained the mechanism operating spiral spring 24.

25 26 represent a pair of screws connecting the gears 15 16 19 20 with the studs or axles 17 18, said screws having laterally-extended heads 27, which are seated in recesses in the gears 19 20 to retain said gears in position on the axles 17 18 with freedom of free rotation thereon. The spiral spring 24 is at one end attached to the central axis 5, its other end being secured to the rim of the large spur-wheel 22. Consequently as said spiral spring is unwound rotary motion is thereby imparted to the large spur-wheel 22, which, through the medium of the gears heretofore described, connected therewith, imparts a multiplied velocity of rotation to the sleeve on which the tape is coiled, thereby winding or coiling the tape thereon with great speed. As the tape is uncoiled by being drawn out through the opening 14 in the case the reverse rotary motion is of course imparted to the train of gearing, which results in the recompression of the spiral spring, the tendency of which always is, unless restrained, to actuate the gearing and tape-carrying sleeve so as to cause the automatic return of the tape within the box or case and the winding or

coiling of said tape on its carrying-sleeve. In order to overcome this tendency of the spiral spring, large spur-wheel, and connected gearing to retract and recoil the tape as it is drawn out for measurements, I supply the case with a brake which consists of a strong plate-spring 28, riveted or otherwise secured, as at 29, to the inner rim of the case, its free end 30 normally pressing against the peripheral rim 31 of the large spur-wheel 22, as clearly shown in Fig. 2, in which position said spur-wheel 22 is frictionally held from rerotation to cause the recoil of the tape. In the free end of this plate-spring 28 is formed an eye 32, within which is contained a pin 33, which works in a curved slot 34 in a segment 35, pivotally journaled in a box 36 on the outer periphery of the case. When it is desired to recoil the tape, a downward pressure is exerted on the outwardly-projecting horn 37 of the segment. Said segment is thereby rocked on its pivot, so as to cause the curved slot 34 to operate against the pin 33 in the free end of the plate-spring and thus draw the free end of the brake-spring away from frictional contact with the periphery of the spur-wheel 22, whereupon the spiral spring will be free to operate to rotate the said spur-wheel, and consequently the train of gears and tape-carrying sleeve, to retract and recoil the tape within the case. On releasing the pressure on the horn of the segment said segment resumes its normal position, and the plate or brake spring again presses against the periphery of the large spur-wheel to brake it.

By the construction shown and described the tendency of the tape is always in the direction of retraction and recoiling within the case. It is thus always maintained in a taut condition, avoids all slackness, prevents the knotting or kinking of the tape, and the breaking and entanglement of the tape with objects, which is so frequently the case where the recoiling of tapes depends upon crank mechanism operated by hand. This construction secures the automatic and more speedy return of the tape within its case, when desired, than is obtainable by crank-operated tape-winders, or those in which the tape is coiled on a drum actuated by a coiled spring. By the use of multiplied gear extremely long tapes may be employed without necessitating the use of an excessively long recoiling-spring.

Having thus described this invention, what is claimed is—

1. A tape-measure, consisting of a case, a diaphragm dividing said case into two compartments, a rigid shaft or axis extending transversely of said case, a sleeve having rotatable bearing on said rigid axis, a tape having end connection with said sleeve, a sleeve enveloping and connected with said tape-connecting sleeve and having a longitudinal slot to admit of the passage therethrough of the tape, a central pinion mounted on one end of said tape-carrying sleeve, toothed gears meshing with said central pinion and having bearing in said diaphragm, a flanged drum mounted on said rigid axis and having a circumferential series of inwardly-extending teeth meshing with the gearing mounted on the diaphragm, and a spiral spring carried by said drum and having end connection, respectively, therewith and with the rigid axis, substantially as and for the purpose set forth.

2. A tape-measure consisting of a case, a diaphragm sectionally dividing said case and having transverse openings therein, a shaft or axis extending transversely of said diaphragm and case and having rigid end bearing in said case, a sleeve having loose rotatable bearing on one end of said shaft, a central pinion mounted on the inner end of said sleeve, a longitudinally-slotted outer sleeve surrounding and connecting with said first-named sleeve to frictionally grip the inner end of the tape thereon, a tape contained in one of the divisions of said case and having connection at its inner end with the inner sleeve and being coiled around the outer sleeve and passing out through a suitable opening in the case, gearing having fixed bearing in said diaphragm and meshing with said central pinion, laterally-positioned gears carried by the pinion-meshing gears, a transversely-flanged spur wheel or drum mounted on said rigid shaft and having inwardly-extending teeth to engage with the teeth of the lateral gears, a spiral spring seated within the outer flanged portion of said spur gear or drum and having end connection, respectively, with said spur gear or drum and with the rigid shaft, substantially as and for the purpose set forth.

3. A tape-measure, consisting of a case, a tape-carrier having rotatable bearing therein, a tape, gearing connected with said tape-carrier, a drum having rotatable bearing in said case and having a circumferential series of teeth engaging said gearing, a spiral spring contained within said drum, a drum-brake consisting of a plate-spring secured at one end to the periphery of said case and frictionally contacting at its other, free, end with the periphery of said drum, a segment pivoted on said case and having a curved slot, and a pin connecting said slotted segment and the free end of said brake-spring, substantially as and for the purpose set forth.

4. A tape-measure consisting of a sectional case having a tape-exit, a rigid shaft or axis extending transversely of said sections, a tape-carrier having rotatable bearing on said rigid axis, a tape coiled on said carrier and contained within one of the sections of said case, multiplying-gears contained within the other section of said case and connected with said tape-carrier, a circumferentially-toothed drum located in said last-named section and meshing with said gears, a spiral spring located in said drum and having end connection therewith and with the rigid axis, and a brake consisting of a curved plate-spring at-

tached at one end to said case and grippingly contacting at its other, free, end with the periphery of said drum, a pin carried by the free end of said plate-spring, and a segment having pivotal bearing on said case and provided with an eccentric slot to receive said pin, substantially as and for the purpose set forth.

5. A tape-measure consisting of a case, a diaphragm dividing said case into two compartments, a rigid axis extending transversely of said compartments, a tape-carrier having rotatable bearing on said axis, a tape located in one of said compartments, tape-winding mechanism located in the other compartment and consisting of a small central pinion mounted on said tape-carrier, a pair of side gears having rotatable bearing on said diaphragm and meshing with said central pinion, small gears carried by said side gears, a drum having rotatable bearing on said axis and provided with an inwardly-extending circumferential series of spur-teeth meshing with said last-named gears, a spiral spring contained within said drum and connected, respectively, therewith and with the rigid axis, and a drum-brake consisting of a curved plate-spring secured to said case and gripping said drum, and an eccentric rockingly journaled on said case and connected with said brake-spring to raise it from contact with the drum, substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

ANDREW J. WILEY.

Witnesses:

SOL. NEWCOMER,

GEO. A. SNOOK.