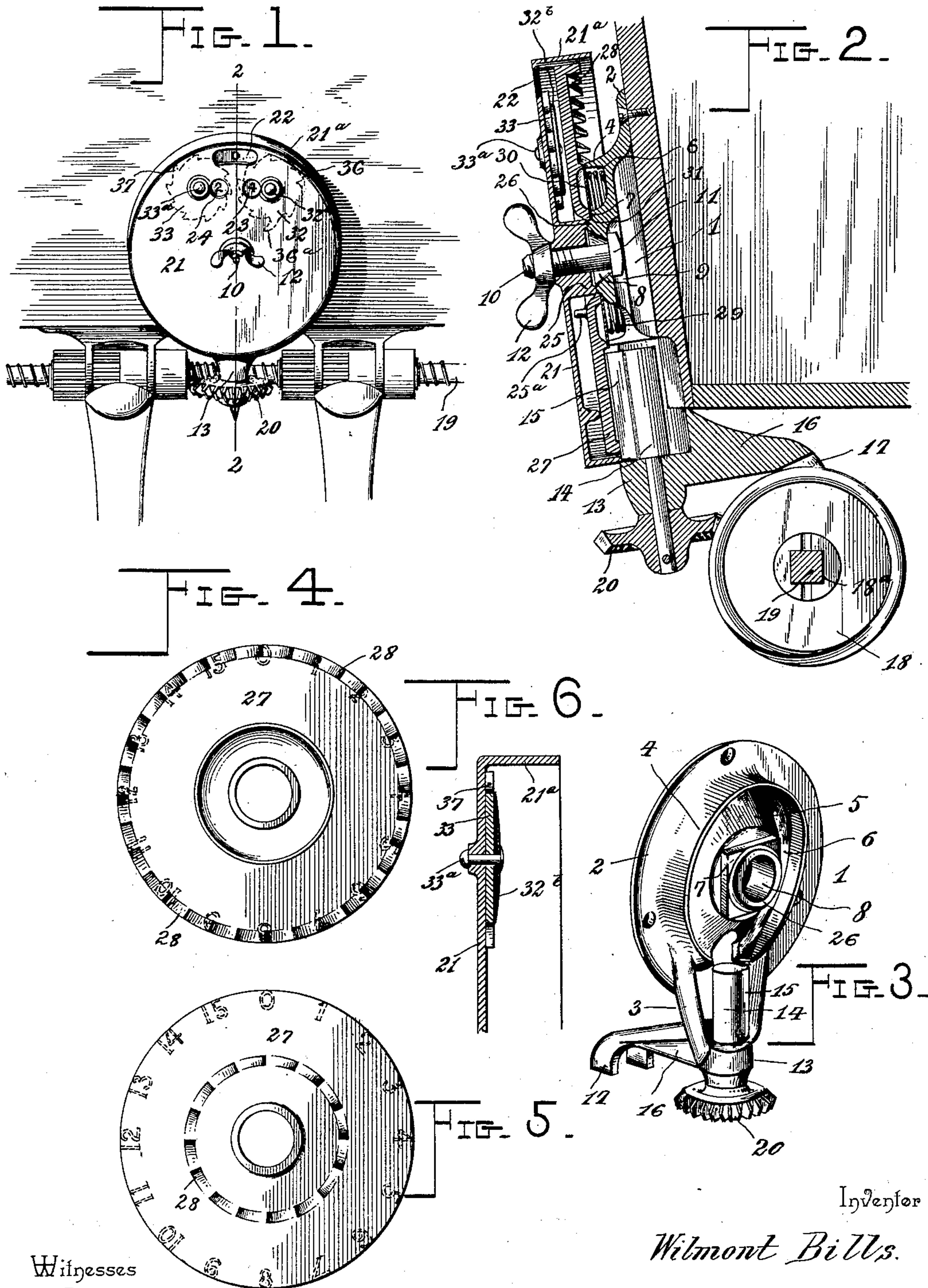


No. 627,381.

Patented June 20, 1899.

W. BILLS.
REGISTER FOR GRAIN DRILLS.
(Application filed Nov. 6, 1897.)

(No Model.)



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UNITED STATES PATENT OFFICE.

WILMONT BILLS, OF DOWAGIAC, MICHIGAN, ASSIGNOR TO THE DOWAGIAC MANUFACTURING COMPANY, OF SAME PLACE.

REGISTER FOR GRAIN-DRILLS.

SPECIFICATION forming part of Letters Patent No. 627,381, dated June 20, 1899.

Application filed November 6, 1897. Serial No. 657,666. (No model.)

To all whom it may concern:

Be it known that I, WILMONT BILLS, a citizen of the United States, residing at Dowagiac, in the county of Cass and State of Michigan, have invented a new and useful Register for Grain-Drills, of which the following is a specification.

My invention relates to improvements in registers for grain-drills; and the object that I have in view is to provide a simple and compact construction by which the acreage planted by the operation of the drill may be accurately registered to indicate to the owner the area under cultivation.

A further object of the invention is to provide an improved construction of the register which may be used to good advantage in connection with drills or seeders of different kinds, the register being so constructed that it may readily and quickly be attached to the drill or seeder.

A further object of the invention is to so construct and arrange the various parts that the register members or dials will not slip or move except when positively actuated by the register-actuating shaft, which is operatively connected through suitable gearing with the seed-dropping shaft of the drill or seeder.

With these ends in view the invention consists in the novel combination of elements and in the construction and arrangement of parts, which will be hereinafter fully described and claimed.

To enable others to understand my invention, I have illustrated the preferred embodiment thereof in the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a rear elevation of part of a seed-planter or grain-drill with my improved register applied thereto. Fig. 2 is a vertical longitudinal sectional view through a part of the planter and the register on the plane indicated by the dotted line 2 2 of Fig. 1. Fig. 3 is a detail perspective view of the supporting-frame forming one of the elements of the improved register. Figs. 4 and 5 are detail views of units-dials of different constructions adapted for use in connection with the register-actuating shaft. Fig. 6 is a detail sec-

tional view through one of the registering-dials, indicating the tension device for preventing said dial from slipping.

Like numerals of reference denote corresponding parts in each of the several figures of the drawings.

The frame 1 of my improved register is cast into a single piece of metal, substantially in the form indicated by Fig. 3 of the drawings. This frame consists of a substantially circular base 2 and a yoke 3, which extends radially from one side of the base. The base has an annular rib or flange 4 projecting from the rear side thereof, and within said rib or flange is a conical boss 5, which is concentric to said rib or flange and forms therewith an annular socket 6. At the outer end of the conical boss is a polygonal seat 7, which protrudes beyond the edge of the annular rib or flange 4, and through said conical boss and the polygonal or angular seat 7 is formed a transverse opening 8. In the front side of the supporting-frame 1 a depression or channel 9 is produced when the frame is cast, and into this channel or depression opens the aperture 8, which is adapted to receive a clamping-bolt 10, the head 11 of which is fitted or contained within the channel 9 to be held thereby against rotation when the thumb-nut 12 is manipulated for the purpose of connecting the various parts together. The yoke 3 terminates in a head 13, which forms the journal-bearing for the actuator-shaft 14. This actuator-shaft is arranged longitudinally within the yoke, and said shaft is provided with a fin or rib 15, which extends from the terminal head of the yoke to the inner extremity of the shaft to enable said shaft to be used in connection with units-dials having their ratchet-teeth placed at different radial distances on the rear faces thereof.

Projecting from the yoke 3 of the supporting-frame is a bracket or arm 16, which is integral with said yoke and is formed at its free lower extremity with a fork 17, and this forked end of the bracket or arm is arranged to straddle a worm-gear 18, which is fitted on the seed-dropping shaft 19 of the grain drill or planter. This worm-gear meshes with a beveled gear 20, fastened to the lower extremity of the ac-

tuator-shaft 14, and said actuator-shaft is thus geared directly to the seed-dropping shaft to be rotated positively thereby.

The registering-wheels are housed or contained within a casing 21, which is cast in disk form with a raised flange 21^a. The casing is provided with a slot 22 and with apertures 23 24, and it is also provided with a central bearing or boss 25.

From the polygonal seat 7 protrudes a circular boss 26, which is coincident with the correspondingly-formed boss 25 of the casing, and these bosses are adapted to aline with each other and to abut together, so as to form a journal on which the units-dial 27 is mounted for free rotation. This units-dial is of a diameter proper to fit within the annular casing 21 of the register, and it has a central opening or orifice of such diameter as to enable it to fit snugly on the registering-bosses 25 26 of the casing and the frame 1 of said register. This units-dial is provided on one face thereof with a series of teeth 28, which are spaced at regular intervals and are substantially V-shaped in form, as shown by Figs. 4 and 5. These V-shaped teeth 28 of the units-dial lie in the path of the longitudinal rib or fin 15 of the register-actuating shaft 14, and said teeth are spaced apart at the proper intervals to provide sufficient clearance between the fin of the register-actuating shaft when the latter is rotated, whereby said shaft 14 is prevented from moving the units-dial beyond the proper predetermined distance. This units-dial is held under tension to prevent it from moving idly or under any conditions except by the positive impingement of the fin of the register-actuating shaft thereon, and the tension device for such dial is arranged in compact relation to the supporting-frame and the dial against which it presses. This tension device consists of a spiral or coil spring 29, which is seated in the annular socket 6, provided for its reception between the rib or flange 4 and the conical boss 5 of the supporting-frame, and said spring is held securely in place by said rib and the boss, while at the same time it is free to expand and contract in the direction of its length in order to have the necessary frictional contact with one face of the units-dial. To prevent the spring from rotating with the units-dial and from retarding the proper rotation thereof by reason of the frictional contact between the spring, the supporting-frame, and the dial, I interpose a metallic washer 30 between one end of the spring and a face of the units-dial, and said washer is prevented from turning with the dial by providing a polygonal opening 31 in the washer and fitting the washer to the polygonal seat 7 at the outer extremity of the conical boss 5, forming a part of the supporting-frame 1. This washer 30 fits snugly to the polygonal seat 7, to be held thereby against axial rotation while having the proper frictional contact with one face of the units-dial, and said washer is substan-

tially flush with the face of said polygonal seat, so that the boss 26 only is exposed for the units-dial to ride thereon.

The units-dial is provided on its front face with a number of figures—say from “0” to “15,” inclusive—which figures are so positioned on the dial as to be exposed through the slot 22 in the casing 21. The tens-wheel 32 is journaled on a pin or arbor 32^a in position for its numerals to be exposed through the opening 23, while the hundreds-wheel 33 is likewise journaled on a pin or arbor 33^a to have its figures exposed through the other opening 24 in said casing. Each wheel 32 33 is held from undue rotation by the binding action of an elastic disk or washer 32^b, and said disk or washer is applied or fitted against the rear side of its proper disk, which is fastened to the arbor or pin in a suitable way—as, for instance, by heading or swaging the inner end of said arbor against the disk, substantially as shown in Fig. 6—whereby the tension-disk is caused to bind or impinge against the registering-wheel to hold the latter in place by frictional contact and yet permit the registering-wheel to move a limited distance when positively actuated by the working elements of the machine.

The units-dial 27 is provided with a stud 25^a, arranged to engage with any one of a series of tangential teeth 36, formed on the peripheral edge of the tens wheel or dial 32, and one of the teeth 36^a of said units dial or disk 32 is longer than the other teeth 36 thereof, so that said long tooth 36^a is adapted to engage with any one of the series of tangential teeth 37, formed on the peripheral edge of the hundreds wheel or dial 33.

The bolt 10 passes through the conical boss, the polygonal stud, and the cylindrical boss 26 of the supporting-frame 1, and it also passes through the central opening in the units-dial and the boss 25 of the casing 21. The head 11 of said bolt 10 is housed and held from rotation in the channel 9 of the supporting-frame, and the protruding threaded end of this bolt receives a thumb or winged nut 12, which binds against the exposed front side of the casing 21, whereby a single bolt only is necessary to hold the operative parts of the register in proper relation to each other.

The worm-gear 18 is provided with an angular or polygonal opening or hub 18^a to adapt it to fit on the seed-dropping shaft 19 of the drill or planter in a manner to rotate with said shaft, and, if desired, the hub of said worm-gear may be provided with notches to receive a fastening pin or key for the purpose of holding the worm-gear against sidewise displacement on said shaft 19. It is not strictly necessary to employ a means for holding this worm-gear against sidewise displacement, because the forked arm 17 of the supporting-frame 1 loosely embraces this worm-gear and serves to hold the same in proper position with relation to the beveled gear 20 on the register-actuating shaft.

My improved register is readily applied to any ordinary grain-drill. It is only necessary to fit the worm-gear 18 on the shaft 19 of said drill and to fasten the supporting-frame 1 to the seed hopper or box, such attachment of the supporting-frame being readily effected by means of screws or their equivalents, which may be passed through openings in the base 2. The worm-gear 18 is positioned on the shaft to engage with the beveled gear 20, and the worm-gear itself is engaged by the forked arm 17 to be free to rotate therein.

When the machine is in motion, the worm-gear 18 is rotated to drive the shaft 14. At each revolution of this shaft 14 its fin 15 strikes one of the teeth 28 on the units-dial to feed the latter with a step-by-step motion, and when the units-dial makes one complete revolution its stud 35 strikes one of the teeth 36 on the tens-dial 32. The latter dial at every complete revolution rotates the hundreds-dial through the medium of its long tooth 36^a striking one of the teeth 37 on said hundreds-dial, and thus all the dials of the register are actuated successively and progressively to indicate the total acreage planted by the machine.

My improved register is adapted for use in connection with grain-drills of different classes by providing interchangeable units-dials having teeth which vary in number. In Fig. 4 I have illustrated a units-dial with a large number of teeth adjacent to its edge or periphery; but in Fig. 5 the units-dial has a smaller number of teeth arranged in annular series quite close to the central opening, by which the dial is supported on the aligned bosses 25 26 of the register. The casing 21 of the register is readily removed by simply detaching the thumb-nut and withdrawing the casing from the bolt, after which one dial can be easily slipped off the bolt, another dial placed in position, and the casing and thumb-nut replaced to connect and hold the parts in their proper positions for operation.

I am aware that changes in the form and proportion of parts and in the details of construction may be made by a skilled mechanic without departing from the spirit or sacrificing the advantages of the invention, and I therefore desire to reserve the right to make such modifications and alterations as fairly fall within the scope of the invention.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. In a grain-register, a supporting-frame provided with a forked arm, and a driving-gear which is embraced loosely by said forked arm to be held thereby from displacement in relation to the operative parts of the register, combined with a casing having registering devices, and an actuator-shaft driven by said gear and operatively connected with said registering devices, substantially as described.

2. In a grain-register, a supporting-frame provided with a yoke and with an extended

forked arm, and a worm-gear which is embraced loosely by said forked arm, in combination with a removable casing supported centrally on said frame, a register-dial mounted axially on the supporting-frame for rotation within the casing, and an actuator-shaft journaled in the yoke and geared at one end to said worm-gear, said actuator-shaft being arranged at one side of the register-dial and engaging intermittently therewith as it is driven by the worm-gear, substantially as described.

3. In a grain-register, a supporting-frame having a circular protruding boss, a casing also formed with a circular boss which is coincident with the boss of the frame and forms therewith a journal, and means for clamping the frame and casing together, in combination with a register-dial fitted loosely on the journal formed by the coincident bosses of the frame and casing, means for actuating said dial, and a spring brake device housed between the frame and casing to act against the register-dial, substantially as described.

4. In a grain-register, a supporting-frame having a disk, an annular flange on one face of the disk, a conical boss within said flange and forming therewith an annular spring-cavity, and a cylindrical boss projecting beyond the conical boss and the annular flange, combined with a casing having a tubular boss which is coincident with the cylindrical boss of the frame and forms therewith a journal, a bolt which passes through the coincident bosses of the frame and casing, a spring housed within the cavity formed by the conical boss and flange of the frame, a register-dial fitted on the journal-bosses, and means for actuating the dial, substantially as described.

5. In a grain-drill register, a supporting-frame provided with a spring-receiving socket and with a polygonal seat, in combination with a casing, a registering-dial, a tension-spring seated within the socket, and a washer or disk connected to and held from rotation by the polygonal seat of the supporting-frame and situated between the registering-dial and said tension-spring, and an actuator mechanism for said registering-dial, substantially as and for the purposes described.

6. In a grain-drill register, a supporting-frame provided with an extended yoke and with a projecting forked arm, combined with an actuator-shaft journaled in said yoke and provided with a fin and with a gear, a worm-gear which meshes with said gear of the actuator-shaft and is confined in place in operative relation thereto by said forked arm, and a registering-dial actuated by the fin of said actuator-shaft, substantially as and for the purposes described.

7. A grain-drill register comprising a supporting-frame having an extended yoke, a forked arm and a protruding boss, a casing having a protruding boss which aligns with the boss of the supporting-frame and forms therewith a journal, a through-bolt for de-

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tachably holding the casing on said support-
ing-frame, a registering-dial mounted on the
journal provided by the bosses of the frame
and the casing, a tension-spring seated in the
5 supporting-frame, a non-rotatable friction
plate or disk interposed between said tension-
spring and the registering-dial, an actuator-
shaft journaled in the yoke of the supporting-
frame and having a fin which engages with
10 said actuator-dial, a worm-gear loosely con-
fined by the fork and geared to the actuator-

shaft, and other registering-dials journaled
in the casing in operative relation to each
other and to the registering-dials, substan-
tially as and for the purposes described. 15

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

WILMONT BILLS.

Witnesses:

E. PHILLIPSON,
CLYDE W. KETCHAM.