Sept. 29, 1931. P. D. PARSONS 1,825,281

REGISTERING DEVICE

Filed June 18, 1928 2 Sheets-Sheet 1

FIG. 1

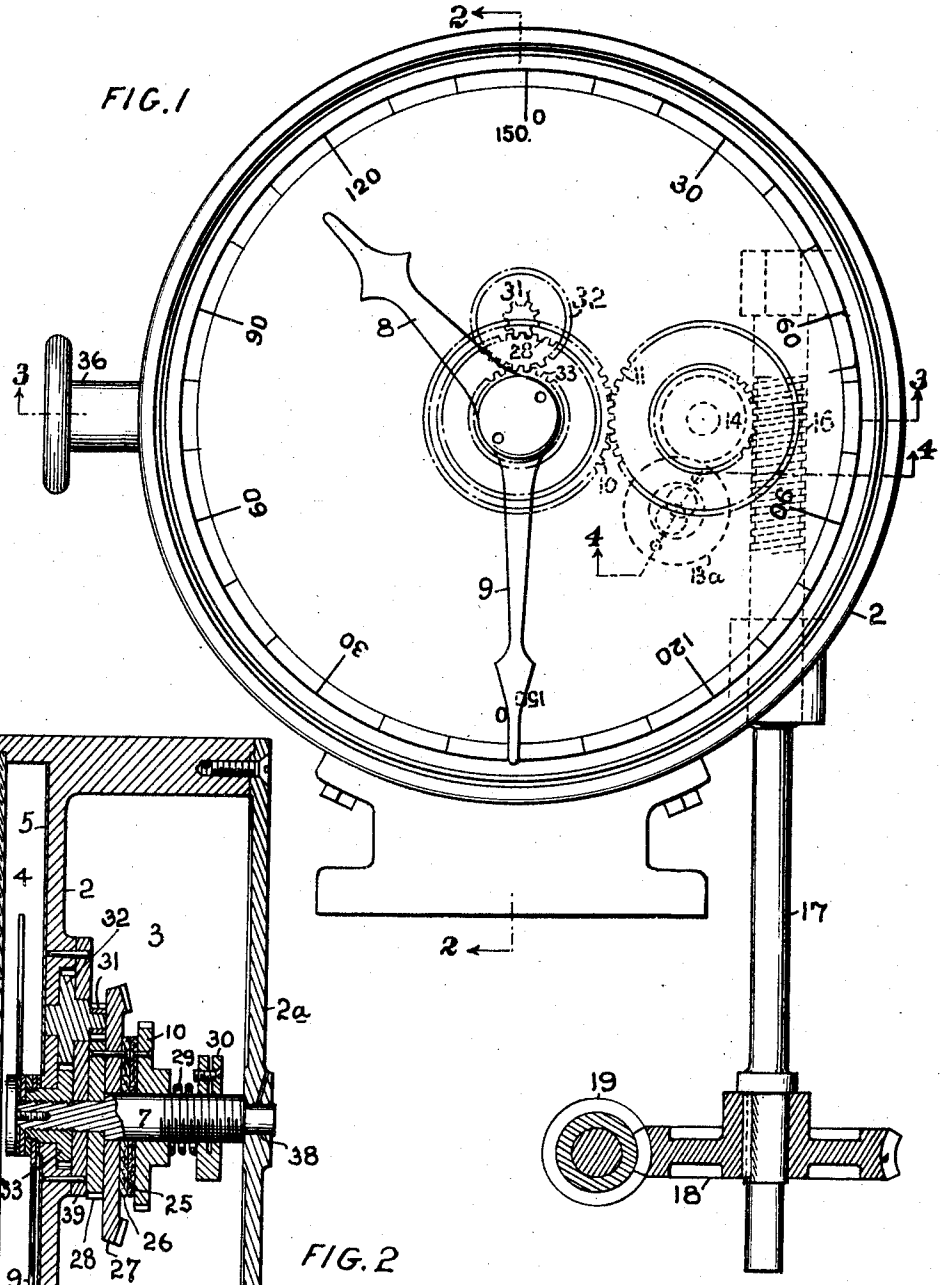


FIG. 2

Inventor
Philip D. Parsons.
By
Attorney.

Sept. 29, 1931. P. D. PARSONS 1,825,281

REGISTERING DEVICE

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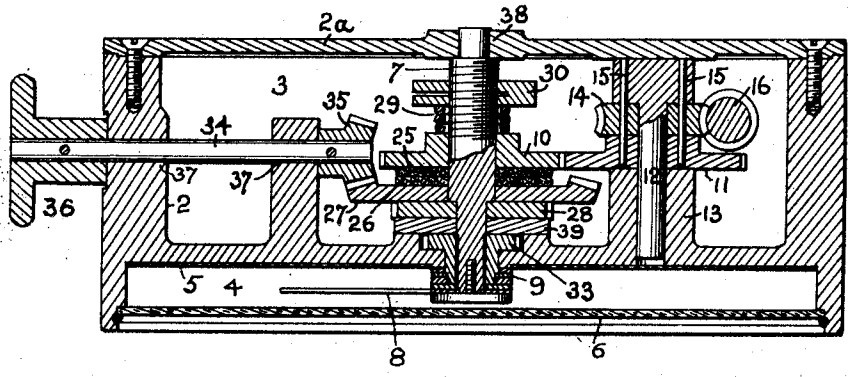


FIG. 3

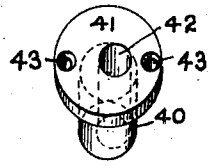


FIG. 5

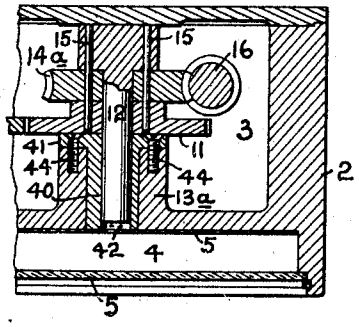


FIG. 4

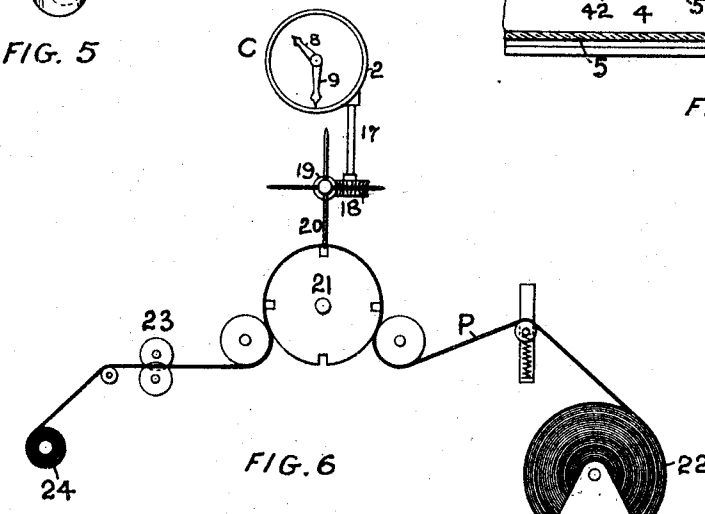


FIG. 6

Inventor
Philip D. Parsons.
By
Attorney.

Patented Sept. 29, 1931 1,825,281

UNITED STATES PATENT OFFICE

PHILIP D. PARSONS, OF SWARTHMORE, PENNSYLVANIA, ASSIGNOR TO SCOTT PAPER COMPANY, A CORPORATION OF PENNSYLVANIA

REGISTERING DEVICE

Application filed June 18, 1928. Serial No. 286,215.

My invention has for its object the practical and efficient construction of gear-changing mechanism suitable for registering devices and for the purpose of changing the relative speeds between a driving member and a driven member such as would be necessary when it is desired to indicate a different number of articles completed by a given operation of the machine.

For the purpose of illustrating my invention, I have shown in the accompanying drawings the embodiment thereof which is at present preferred by me, since the same is in form to give satisfactory and reliable results, but it is to be understood that the several instrumentalities of which my invention consists can be variously arranged and organized and that my invention is not limited to the precise arrangement and organization of the instrumentalities herein shown and described.

Referring to the drawings: Fig. 1 is a front view of my improved registering device adapted to be applied to any commercial machine; Fig. 2 is a vertical sectional view of the same taken on line 2—2 of Fig. 1; Fig. 3 is a horizontal sectional view of the same taken on line 3—3 of Fig. 1; Fig. 4 is a horizontal section of a portion of the same taken on line 4—4 of Fig. 1; Fig. 5 is a perspective view of a portion of the structure shown in Fig. 4; and Fig. 6 is a diagrammatic view illustrating the application of my improved counting or register to a machine for toilet paper in roll form.

In general appearance, my improved register is made in clock form in which the large hand or pointer 9 travels five times as fast over the dial as does the smaller hand or pointer 8, the dial being divided into two sets of markings, each set being for one hundred and fifty sheets. It is manifest that this marking of the dial may be for any other indication as to quantities, to suit the particular machine to which it is to be applied, it only being necessary to provide the right number of revolutions of the operating worm shaft 17 to make the movements of the hands or pointers and the dial suit the requirements of said machine.

Referring to Fig. 6, which shows the register as applied to a web perforating machine used in the manufacture of toilet paper rolls, wherein each roll is to be composed of a given number of sheets per roll, P represents the web of paper being drawn from a roll 22 and about a cylinder 21 upon which it is perforated transversely by the blades 20 of a perforating cylinder at intervals along its length, and which web is thereafter slitted by the slitting cutters 23 and wound into individual rolls at 24. 19 represents a worm secured to the shaft of the perforating head and cutters 20 and is adapted to drive a worm wheel 18 upon the vertical worm shaft 17 by which the counter or register C is operated. Reference to this adaptation of my improvement is by way of an example of its use and not as a limitation.

In Fig. 1, the particular numbering on the dial mounting from zero to 150, twice repeated, is an example of the dial used in connection with the counting or registering of paper towels, in which one hundred and fifty towels constitutes a "run" for each package or carton, and the pointers in traversing the dial indicate to the operator when the proper number of towels have been automatically assembled into the quantity necessary for a package.

Referring more specifically to the details of construction of the counter or register, 2 represents the casing which is provided with a closure plate 2a at the back and a dial 5 at the front and enclosed back of the glass front or window 6. In the space 4 between the dial and the glass front are arranged the pointers or hands 8 and 9.

7 is a central shaft which is journaled in the back plate at 38 and near its forward end in plate 39, and has secured to its front end the small pointer or hand 8. The large hand or pointer 9 is secured to the hub of a gear 33 which meshes with a smaller gear 32 provided with a pinion 31 which meshes with a spur gear 28 in turn attached to a large bevel gear 27, said spur gear 28 and bevel gear 27 being rigidly secured to the shaft 7, and by means of which said shaft is rotated. It will be manifest that for every

rotation of the shaft 7, the small hand or pointer 8 will be rotated once, and by reason of the other gears and pinions, the large hand or pointer 9 will rotate ten times for every one revolution of the small hand 8.

The relative rotations of the large and small hands may be varied as may be desired, merely by changing the number of teeth in the several gears 28, 31, 32 and 33, or any of them, at the option of the manufacturer, to suit the requirements of use of the machine. This form of gearing is similar to that employed in a clock movement and will need no further explanation. In the particular construction shown, however, the plate 39 is secured to the main casing and constitutes a bearing, not only for the shaft 7, but also for the gear 32 and pinion 31.

10 is a gear wheel loosely journaled upon the shaft 7 and is faced with a leather or friction disk 25 which co-acts with a similar leather or friction disk 26 secured to the bevel gear 27, and said friction pads 27 are pressed into driving contact by means of a spring 29 surrounding the shaft 7 and pressing upon the hub of the gear 10 to yieldingly force the said gear toward the bevel gear 27, as will readily be understood by reference to Fig. 2. The tension of this spring 29 may be adjusted by the position of the nut 30 which is screwed upon the shaft 7 and frictionally held thereon in adjusted positions.

The gear 10 is driven by a gear 11 the same being detachably secured to a stub shaft 12 which is journaled in a hub 13 within the chamber 3 of the casing 2. Also secured upon the stub shaft 12 is a worm wheel 14, the said worm wheel and gear 11 being secured to and caused to rotate in unison with the stub shaft 12 by means of the pins 15 which extend through the head of the stub shaft and through the said worm wheel and gear, as is clearly indicated in Fig. 3. The stub shaft is held in its bearing 13 by the back plate 2*a*. The worm wheel 14 is driven by the worm 16 upon the upper end of the shaft 17 which it extends into the casing 2.

It will now be seen that the rotation of the shaft 17 solely rotates the gear 11 through the worm 16 and worm wheel 14, and that said gear 11 drives the gear 10 and through the friction disks 25 and 26 causes the shaft 7 to be rotated, and with it, the pointers or hands 8 and 9.

To enable the hands to be set so as to bring the large pointer to zero, I provide a horizontal shaft 34 journaled in the casing at 37 and connected at the inner end with a bevel pinion 35 meshing with the bevel gear 27, and having at its outer end a milled wheel 36 by which to rotate it. It will be obvious that by rotating the shaft 34, the gear 27 and the train of gears leading up to the hands or pointers may be rotated for adjustment of the hands independent of the operation of the shaft 17 and its connected parts.

As my improved counter or register is intended to be adaptable to counting different numbers of articles made by the machine to which it is attached, I provide the following means which will enable the device to be adjusted to suit varying conditions: To one side of the hub 13 within the chamber 3 of the casing, I provide a second hub 13*a* which hub is fitted with an adjustable bushing 40 having a tubular bearing 42 of the same diameter as the bearing in the hub 13, so that the stub shaft 12 may be withdrawn from the hub 13 and fitted into the bearing 42 of the hub 13*a* when it is desired to change the relative speed or movement of the hands 8 and 9 as compared to the revolutions of the worm 16 and its shaft 17. By reference to Fig. 4, it will be seen that this stub shaft 12, together with the gear 11, is positioned on the hub 13*a*, and by reference to Fig. 1, it will be seen that while the stub shaft 12 and the gear 11 maintain their same relation with the gear 10 of the shaft 7, the radial distance from the axis of the stub shaft 12 to the axis of the worm 16 is greater than it was in the case where the stub shaft was journaled in the hub 13 and as shown in Fig. 3. This necessitates a larger worm wheel 14*a* being fitted to the stub shaft 12 to mesh with the worm 16. It is, therefore, self-evident by comparing Figs. 3 and 4, that the worm wheels 14*a* are materially larger in diameter than the worm wheels 14. Therefore, by adjusting the stub shaft to the hub 13*a* and substituting a larger worm wheel 14*a*, to mesh with the worm, the relative speed of movement of the hands will be increased in respect to the revolutions of the worm 16 and its shaft 17, or vice versa. This change is easily performed in that all that is necessary is to remove the back 2*a*, withdraw the stub shaft 12, remove the gear 11 and worm wheel 14 from the stub shaft and its pins 15, substitute the larger worm wheel 14*a*, replace the gear 11 and insert the stub shaft 12 into the bearing 42 of the bushing 40 in the hub 13*a*. This will insure the power transmitting connection between the gear 10 and the worm 16, and with a slower speed of revolution of shaft 7 as compared to the revolutions of worm 16 and its shaft 17.

As a further capacity of adjustment, the bearing 42 in the bushing 40 is eccentrically positioned with respect to the axis of the bushing; by turning the bushing 180°, will cause the bearing 42 of the bushing to take the position corresponding to the lower small dotted circle in Fig. 1. The re-positioning of the bushing may be secured by

the small screws 44 which pass through holes 43 in the flange 41 of the bushing 40 (Figs. 4 and 5). With this adjustment, the gear 11 will still retain its meshed relation with the gear 10, and a still larger worm wheel may be substituted for the worm wheel 14 or 14*a* and hence another relative difference in rotation may be had between the worm 16 and the shaft 7.

It will be further understood that the eccentric bushing may be adjusted in other positions within the hub 13*a*, but these positions would necessitate not only a substitution of the worm wheel of a different pitch diameter, but also a change in the gear 11 whereby it may have a greater number or less number of teeth than the gear as shown.

It is manifest that while two hands for indicating the counting of the articles produced are more desirable than the employment of one hand alone, nevertheless, I do not confine myself to the employment of two hands, as it is evident that either one may be omitted without impairing the operation of the device in connection with the other hand.

One of the advantages of having two hands lies in the fact that where the dial is provided with a definite zero or other mark, the arrival at said mark of both hands will definitely determine that a "run" of goods, such as five cartons of one hundred and fifty towels each, has been completed. In a general way, it may be said that it would only be necessary to place upon the dial a mark which would indicate the place thereon where both hands should come into alinement for the completion of a "run", as it would be assumed that when the register was adjusted to provide for the proper number of sheets or articles to constitute a "run", the same would always be made in the required numbers when the two hands came into alinement.

From what has before been stated, it will be understood that when employing this register in connection with any machine, the adjustment of the gears and worm wheels within the casing, and if desired the gearing which connects the shaft 17 to the machine, would be proportioned to insure the proper movements of the hands over the dial to enable them to come into alinement on the completion of a "run". Otherwise, the register may be employed in the usual manner wherein the large hand indicates the successive production of the articles, whereas the small hand may operate to register the total number, similarly to other types of registers.

It will now be apparent that I have devised a novel and useful construction which embodies the features of advantage enumerated as desirable, and while I have in the present instance shown and described the preferred embodiment thereof which has been found in practice to give satisfactory and reliable results, it is to be understood that I do not restrict myself to the details, as the same are susceptible of modification in various particulars without departing from the spirit or scope of the invention.

Having now described my invention, what I claim and desire to secure by Letters Patent is:

1. A driving worm shaft and a driven member having a spur gear, combined with gear-changing means between the driving and driven members, said means comprising bearings fixedly positioned for the driving shaft and driven member, two stub shaft bearings respectively arranged at different relative distances from the aforesaid bearings, a stub shaft arranged for operation in either of the two stub shaft bearings, a worm wheel detachably secured to the stub shaft and of a diameter to accommodate itself to the position of the stub shaft in the respective stub shaft bearings, and a spur gear detachably secured to the stub shaft so as to be positively driven therewith and of a diameter to accommodate itself to the position of the stub shaft in respect to the stub shaft bearings, and whereby said stub shaft maintains geared connection with the worm of the driving shaft and the spur gear of the driven member.

2. The invention according to claim 1, wherein further, one of the stub shaft bearings is formed eccentrically in a bushing and capable of adjustment circumferentially to change the distance between the stub shaft bearing and the worm of the driving shaft while retaining the same distance between the stub shaft and the driven member.

In testimony of which invention, I hereunto set my hand.

PHILIP D. PARSONS.