Nov. 9, 1948. F. Q. RAST 2,453,342

TOTALIZING MECHANISM

Original Filed April 15, 1944 2 Sheets-Sheet 1

Fig. 1.

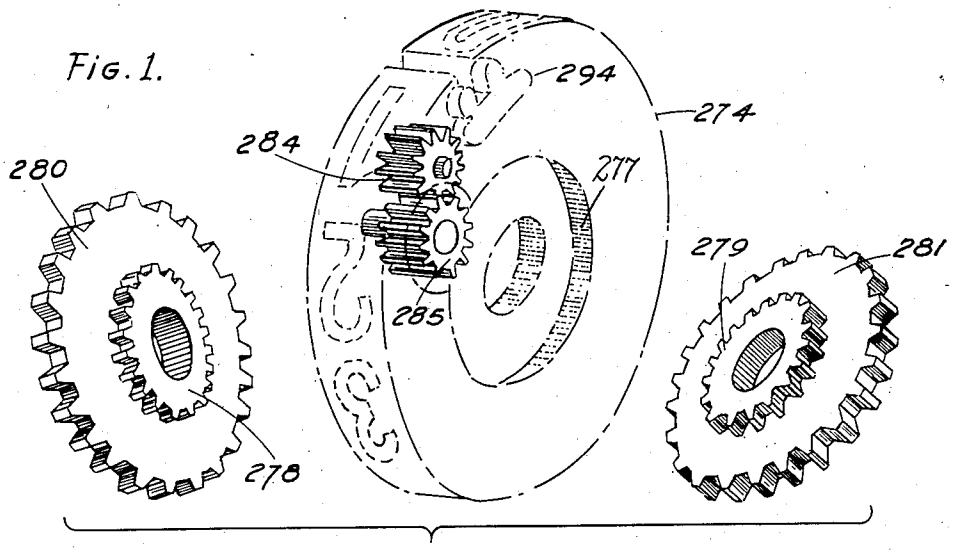
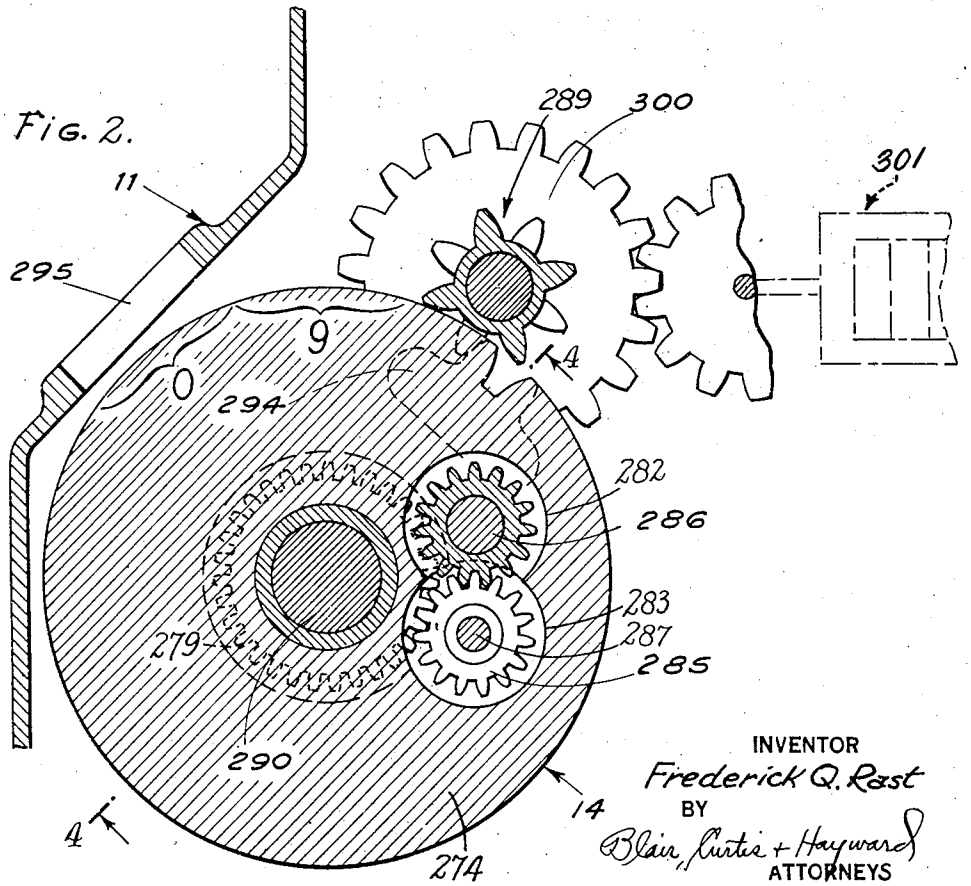



Fig. 2.




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Fig. 3.

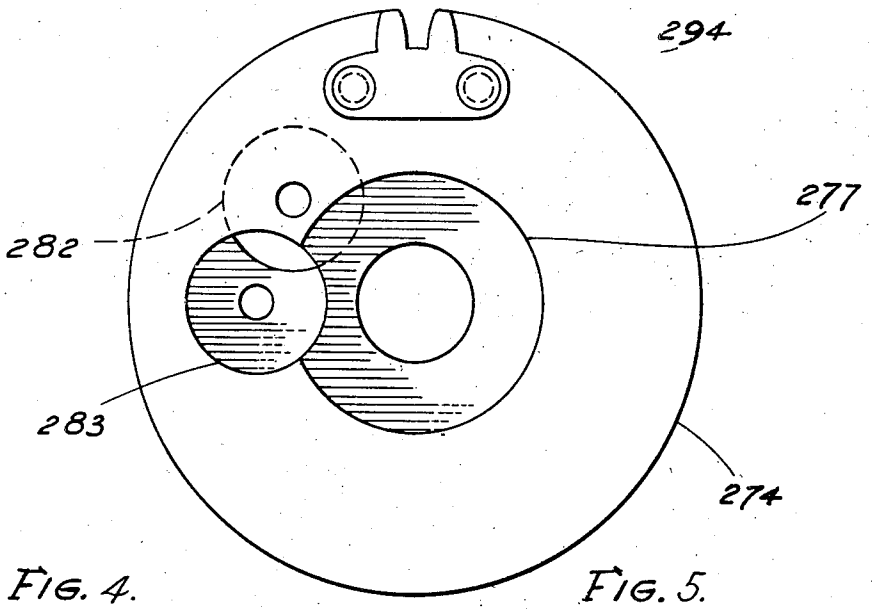



Fig. 4.

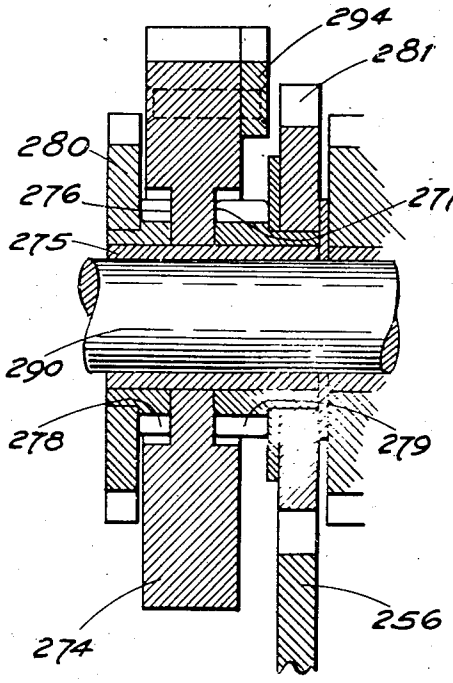
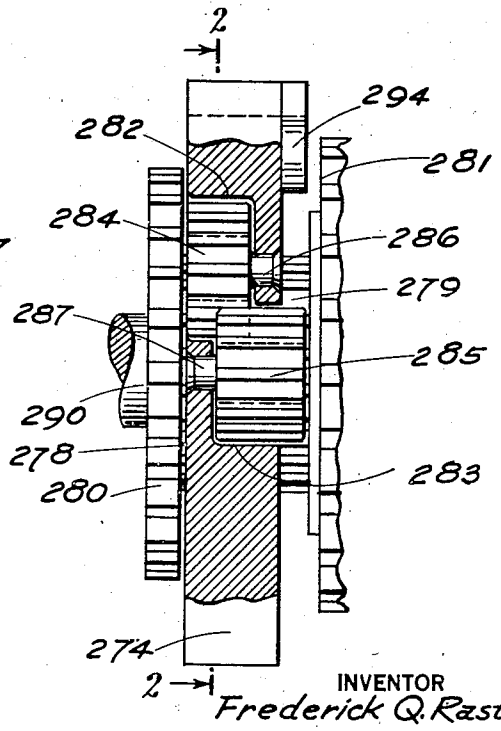



Fig. 5.




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# UNITED STATES PATENT OFFICE

2,453,342

## TOTALIZING MECHANISM

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Original application April 15, 1944, Serial No. 531,232. Divided and this application February 24, 1945, Serial No. 579,549

2 Claims. (Cl. 235—91)

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This invention relates to totalizing mechanism.

One of the objects of this invention is to provide totalizing mechanism which is simple, thoroughly practical, and durable in use. Another object is to provide mechanism of the above character which will be efficient and accurate in operation. Another object is to provide mechanism of the above character which may be manufactured from inexpensive materials without undue labor costs. Another object is to provide mechanism of the above character which will be strong and well able to withstand the strains of hard usage. A further object is to provide mechanism of the above character which will totalize units fed into it from two different sources without regard for the timing of the feeding of units into the mechanism from either source. Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements, and arrangements of parts, all as will be illustratively described herein, and the scope of the application of which will be indicated in the following claims.

Referring now to the accompanying drawings in which is shown one of the various possible embodiments of this invention,

Figure 1 is an exploded perspective view of certain parts of the totalizing mechanism;

Figure 2 is a vertical section on an enlarged scale taken on the line 2—2 of Figure 5;

Figure 3 is a side elevation on an enlarged scale of the totalizing wheel;

Figure 4 is a vertical section taken on the line 4—4 of Figure 2; and

Figure 5 is a side elevation of the totalizing mechanism partly in section to show the mounting of the differential pinions thereon.

Similar reference characters refer to similar parts throughout the several views of the drawings.

This application is a division of the copending application of Frederick K. Rast, which bears Serial No. 531,232, and which was filed on April 15, 1944.

The totalizing mechanism to be described hereinafter is particularly adapted for use in a machine where it is desirable to transmit into a single member the accumulative total of movement of two members. In the embodiment disclosed the feeding members are two gears which are geared to a totalizing member in such a manner that, for example, if one feeding gear makes one-half of a revolution and the other feeding

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gear makes one-quarter of a revolution, the totalizing member is driven three-quarters of a revolution or the total of the movements of both feeding gears. As another example, if the feeding gears are feeding units into the totalizing member and three units are fed into the totalizing member by one gear and six units are fed into the totalizing member by the other gear, then the totalizing member is moved an amount equal to nine units.

Referring first to Figure 4, the totalizing member, which in the present embodiment is an indicator wheel 274, is rotatably mounted on a bushing 275 mounted on register shaft 290. Indicator wheel 274 has two sun gear bores 276 and 277 cut into the opposite sides thereof concentric to the axis of rotation of the indicator wheel. These bores are made to receive two sun gears 278 and 279 (Figures 1 and 4) which are rotatably mounted on bushing 275 on opposite sides of indicator wheel 274. Sun gear 278, which has twenty teeth, has a gear 280 having twenty-five teeth mounted on and connected to its hub and sun gear 279, which has twenty teeth, also has a spur gear 281 mounted on and connected to its hub having twenty-five teeth.

Indicator wheel 274 has two other bores 282 and 283 (Figure 3) extending into the body of the indicator wheel from opposite sides thereof. These bores 282 and 283 are in overlapping relationship with respect to each other and bore 282 overlaps sun gear bore 277 and bore 283 overlaps sun gear bore 276. Differential pinions 284 and 285 are rotatably mounted on pins 286 and 287 (Figures 2 and 5) mounted on the indicator wheel 274. When sun gears 276 and 277 and the indicator wheel 274 are in assembled relationship, the differential pinions 284 and 285, which mesh at the point bores 282 and 283 (Figure 3) overlap, mesh with sun gears 278 and 279 (Figures 1 and 5), respectively.

Units are fed into spur gears 280 and 281 by a feeding gear 256 and a similar gear (not shown) in meshing engagement with gear 280 which turn in the same direction during feeding. In order that the totalizing mechanism accurately total the sums fed into it, it is necessary that the units of movement fed into it from the feeding gears be comprised of an equal number of gear teeth. In the present embodiment a movement of five teeth of either of the feeding gears is the equivalent of one unit and the periphery of the indicator wheel carries the ten digits from zero to nine on its surface equidistantly spaced with respect to each other. When feeding gear 256 moves a dis-

tance of five teeth, it acts through spur gear **281** to drive sun gear **279** a distance of four teeth as spur gear **281** has twenty-five teeth and sun gear **279** has twenty teeth. If feeding gear **400** is stationary, because of the action of the differential, indicator wheel **274** is turned a distance equivalent to two of the teeth of sun gear **279** or one-tenth of a revolution. As a complete revolution of wheel **274** amounts to ten units, the result is that wheel **274** is moved a distance of one unit. Accordingly, each time feeding gear **256** or feeding gear **400** moves a distance of five teeth, then wheel **274** is moved a distance of one unit.

If units are being fed into the indicator wheel from both feeding gears, then both sun gears **278** and **279** are turned in the same direction a distance of four teeth for each unit fed into them. This locks the differential pinions with respect to each other and with respect to their respective sun gears with the result that wheel **274** is turned a distance equivalent to four teeth of a sun gear or two units. Thus whenever both gears are feeding units into the indicator wheel, the indicator wheel is moved a distance equivalent to the total of the units fed into it. Furthermore, the timing of the feeding of units by the feeding gears into the totalizing mechanism can vary because of the differential and thus, for example, feeding gear **400** may be one-third the way through feeding a unit into wheel **274** when feeding gear **256** begins feeding its unit in and nevertheless wheel **274** will accurately record both units.

If the totalizing mechanism forms a part of a gear train in a computing machine, then the totalizing member may be provided with gear teeth on its periphery instead of carrying digits from zero to nine thereon. If the wheel carries digits, it is desirable to keep track of the revolutions of the indicator wheel and to thus record the total amount fed into the indicator wheel. To accomplish this, the indicator wheel **274** may be provided with a pair of Geneva transfer teeth **294** (Figure 2) which turn a Geneva transfer pinion **289** a distance of two teeth or one-quarter of a revolution each time indicator wheel **274** makes a revolution. A gear **300** connected to transfer pinion **289** is preferably geared to feed ten units into suitable registering mechanism, generally indicated at **301**, each time pinion **289** makes one-quarter of a revolution. Thus an accurate record of the units fed into the indicator wheel may be kept. The indicator wheel **274** is preferably mounted in a housing **11** having a window **295** through which only one digit on the wheel is visible at one time. This permits reading of the units which have not been transferred to the registering mechanism by the transfer pinion **289**. The transfer of ten units to the registering mechanism is so timed that it takes place each time the digit visible through window **295** changes from nine to zero.

Thus it will be seen that efficient and practical totalizing mechanism is shown and described which accurately totals units fed into it from two different sources. Furthermore, this mechanism is so constructed that it totals units fed into it from either or both sources operating either singly or in unison without regard for the timing of the feeding of units by either source. Thus it will be clear that the objects hereinabove mentioned as well as many others have been successfully accomplished.



As many possible embodiments may be made of the above invention all without departing from the scope of the invention it is to be understood that all matter hereinbefore set forth, or shown in the accompanying drawings, is to be interpreted as illustrative and not in a limiting sense.

I claim:

1. In totalizing mechanism, in combination, an indicator wheel rotatably mounted on a shaft, said indicator wheel having digits from 0 to 9 on its periphery, a pair of differential pinions rotatably mounted on said wheel in meshing relation with respect to each other, a pair of sun gears of the same size rotatably mounted on said shaft, each of said sun gears meshing with one of said differential pinions, separate gear means of the same size for driving each of said sun gears in the same direction, each of said gear means being adapted to feed units into its sun gear, all units fed into said sun gears being equivalent in the amount of movement produced in a sun gear, whereby said sun gears acting through said differential pinions cause said indicator wheel to rotate an amount equal to the sum of all units fed into it from both sun gears, and tens transfer means actuated by said indicator wheel for registering accumulated tens.

2. In totalizing mechanism, in combination, an indicator wheel rotatably mounted on a shaft, said indicator wheel having digits from 0 to 9 on its periphery, a pair of differential pinions rotatably mounted on said wheel in meshing relation with respect to each other, a pair of sun gears of the same size rotatably mounted on said shaft, each of said sun gears meshing with one of said differential pinions, separate means for feeding units into each of said sun gears, said means driving said sun gears in the same direction, all units fed into said sun gears being equivalent in the amount of movement produced in a sun gear, whereby said sun gears acting through said differential pinions cause said indicator wheel to rotate an amount equal to the sum of all units fed into it from both sun gears, tens transfer means mounted on the periphery of said indicator wheel, a Geneva transfer pinion, said tens transfer means actuating said Geneva transfer pinion, and a register actuated by said transfer pinion to register tens accumulated by said indicator wheel.

FREDERICK Q. RAST.


REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

| Number | Name | Date |
|---|---|---|
| 503,946 | Cook | Aug. 29, 1893 |
| 1,469,932 | Adams | Oct. 9, 1923 |

FOREIGN PATENTS

| Number | Country | Date |
|---|---|---|
| 102,105 | Austria | Dec. 28, 1925 |
| 23,241 | Great Britain | 1906 |