Dec. 8, 1942. G. W. WHITE 2,304,516

COUNTER

Filed June 26, 1941

Fig. 1

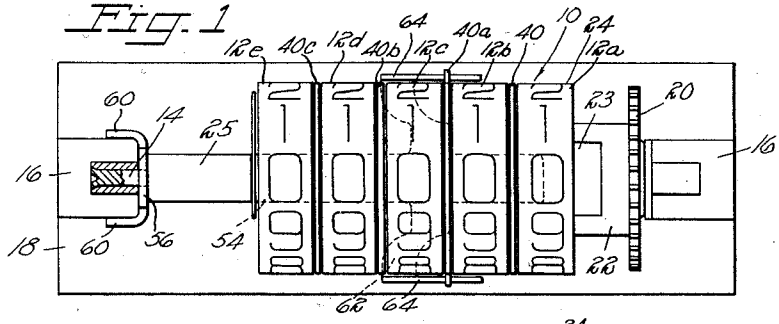


Fig. 2

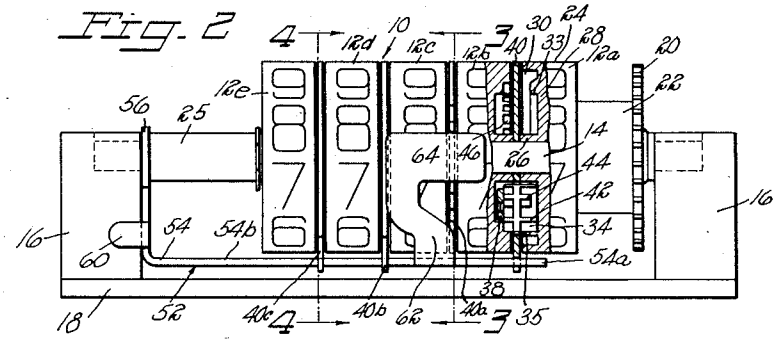


Fig. 3

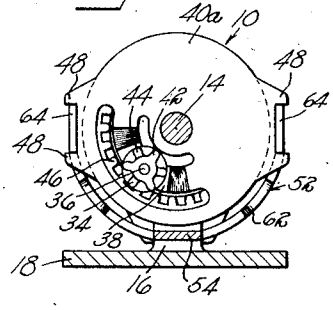


Fig. 4

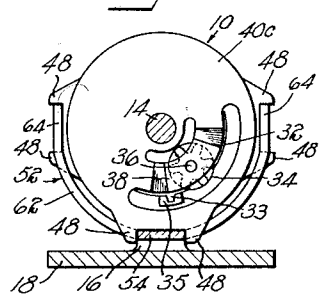
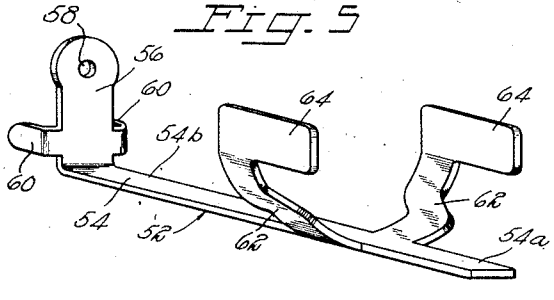


Fig. 5



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UNITED STATES PATENT OFFICE

2,304,516

COUNTER

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4 Claims. (Cl. 235—117)

The present invention relates to counters and more particularly to improvements in counters of the internal transfer pinion type. More specifically, the present invention relates to counters of the internal transfer pinion type and wherein the transfer pinion is supported on a partition plate positioned between adjacent numeral wheels of successively higher order.

The object of the present invention is to provide improved means for retaining or holding the partition plate against rotation after assembly of the counter; these means also greatly facilitating the manufacture and assembly of the several parts of the counter into a single unit.

A still further object is the provision of means for retaining the partition plate against rotation, which means may be made from a single set of forming dies and thereafter cut to proper size to enable its use with several different combinations of counter wheel assemblies.

Other objects will be in part obvious and in part pointed out more in detail hereinafter.

The invention accordingly consists in the features of construction, combination of elements, and arrangement of parts which will be exemplified in the construction hereafter set forth and the scope of the application of which will be indicated in the appended claims.

In the accompanying drawing:

Figure 1 is a plan view of a counter embodying the invention with the counter mounted in operative position on a suitable supporting base;

Fig. 2 is a side view of the counter shown in Fig. 1;

Fig. 3 is a view taken on the line 3—3 of Fig. 2;

Fig. 4 is a view taken on the line 4—4 of Fig. 2; and

Fig. 5 is a perspective view of the assembly and retaining member.

Referring to the drawing, there is shown generally a counter 10 including a plurality of numeral wheels 12*a* to 12*e* of successively higher order coaxially arranged and freely rotatable on a shaft 14. The shaft 14 is journalled at its opposite ends in uprights 16 extending vertically from a base plate 18. There is also rotatably mounted on the shaft 14 a driving gear 20 which is integral with a collar 22 keyed at 23 to the adjacent numeral wheel 12*a* whereby upon rotation of the gear 20 the numeral wheel will be simultaneously rotated. Obviously the gear 20 will be connected through any suitable means to the device from which the count is to be taken. The collar 22 also prevents lateral movement of the wheels toward gear 20, and lateral movement of the counter wheels toward the opposite end of the shaft is prevented by a collar 25 secured to the shaft adjacent the highest order wheel.

Referring more particularly to the counting mechanism, each numeral wheel is formed with a relatively wide periphery 24 which, as usual, is graduated in tenths; the periphery being spaced from a hub 26 by a web 28 located centrally thereof to provide a recess in each face of the wheel. Located in the recess 30 of wheel 12*a* adjacent wheel 12*b* and integral with the face of the web 28 is a laterally projecting locking ring 32 provided with an aperture 33 aligned with a two-tooth transfer gear 35. The locking ring 32 and gear 35 cooperate with an internal transfer pinion 34 supported on a pin 36 extending laterally from a supporting bracket 38 stamped from a partition plate 40. As seen in Fig. 2, when the pinion is so supported it lies centrally of the partition plate and extends into the recesses 30 of adjacent numeral wheels to each side of the plate 40.

The transfer pinion 34 is of the usual mutilated type having long teeth 42 extending entirely across the gear and short teeth 44 alternately spaced between the long teeth. As usual with this construction, upon rotation of the lowest order wheel 12*a*, the locking ring 32 will normally span two of the long teeth of the transfer pinion 34 to hold it against rotation until the two-tooth gear 35 and aperture 33 cooperate with the transfer pinion to advance the latter one step.

As best seen in Fig. 2, all the teeth of the transfer pinion to the left side of the partition plate mesh with a gear 46 formed on the internal surface of the next higher order wheel 12*b* whereby upon each rotation of the transfer pinion by the lowest order wheel the higher order wheel will simultaneously be advanced one step. In like manner, each succeeding higher order wheel 12*c*, 12*d*, and 12*e* is advanced one step upon a complete revolution of a preceding order wheel through transfer means which, being similar to those between wheels 12*a* and 12*b*, need not be further described.

As previously stated, the transfer pinions 34 are mounted on a partition plate 40, which, for convenience in manufacture, is slidably mounted and also rotatable on the supporting shaft 14. In like manner, there are also provided partition plates 40*a*, 40*b*, and 40*c* respectively positioned between the other order wheels of the counter. To obtain a proper transfer, the pinion 34 must not rotate relative to shaft 14, and, to prevent this, the partition plates 40, 40*b*, and 40*c* are

vided as to depend from the plate and be transversely spaced relative to one another. The partition plate **40***a* differs from the others in that it is provided with oppositely disposed sets of lugs **48** which, as seen in Figs. 3 and 4, are so positioned when the parts are assembled as to extend laterally from the plate and be vertically spaced from one another.

The lugs **48** are positioned in the manner described to cooperatively engage with restraining arms carried by a holding bracket **52**. As best seen in Fig. 5, the bracket **52** is formed from a single piece of metal to provide an elongated restraining arm **54** having a free outer end and a fixed inner end extending at right angles from a vertical leg **56**. The bracket further includes oppositely disposed, relatively short restraining arms **64** angularly spaced from arm **54** by connectors **62** extending upwardly from arm **54** intermediate of the ends thereof. In the embodiment illustrated, it will be seen that the arm **54** lies in a plane in vertical alignment with shaft **14**, whereas the arms **64** are angularly spaced to lie in a plane in horizontal alignment with the shaft **14** whereby when the arm **54** is seated between the depending lugs **48** of the partition plates **40**, **40***b*, and **40***c*, the vertical arms **64** will be seated between the lateral lugs of the partition plate **40***a*, and the partition plates will all be held in proper alignment relative to one another.

To prevent rotation of the partition plates, the bracket leg **56** further includes an aperture **58** through which the shaft **14** extends. Located below the recess and extending rearwardly from each side of the leg **56** are spaced fingers **60** which straddle the upright **16** and thus restrain the bracket against rotation, which in turn restrains the counting mechanism partition plates and the transfer pinions supported thereby against rotation.

By manufacturing the retaining bracket **52** in the manner described, assembly of the counter is greatly facilitated in that the counting mechanism—namely, the wheels **12***a* to **12***e*, inclusive—together with the partition plates may initially be mounted onto the shaft **14**. Thereafter the end of the shaft **14** may be inserted through the aperture **58** in the vertical leg **56** of the bracket **52** and the latter pivoted into position to align the arm **54** with the depending lugs **48** and the arms **64** with the lateral lugs **48**. This may readily be done as the connectors **62** are sufficiently resilient to permit the arms **64** to spring apart and then snap into position when in proper alignment between the positioning lugs. Thereafter the assembled counter may be inserted within the frame with the positioning fingers **60** straddling the upright, thus preventing rotation of the bracket and the partition plates. It will also be noted that the arms **64**, in addition to preventing rotation of the partition plate, function together with the vertical leg **56** to properly support the bracket.

Another advantage of making the supporting bracket in the manner described is that by positioning the U member **62** intermediate of the ends of the arm **54** it divides the arm into a forward portion **54***a* and a rear portion **54***b*. Because of this, the bracket may be used with counters having various numbers of numeral wheels. For example, if six wheels were to be used instead of the five shown, the six could readily be used on the shaft **14** as the portion **54***b* of the arm **54** affords sufficient room for the securing of another whole counter to be shifted towards the left, the portion **54***a* may be cut off, whereupon the partition plate **40***a* would then be used between the lowest and the next higher order wheel and secured in position by the arms **64**. It is also apparent that any suitable means could be carried by the bracket for engaging a part of the frame in order to hold the bracket against rotation; the fingers **60** being shown in the present embodiment as a convenient manner in which to accomplish this.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

I claim as my invention:

1. In a counter unit having at least three numeral wheels, a partition plate between each pair of said numeral wheels, a bracket having an elongated restraining arm, and a pair of short restraining arms angularly spaced from the first arm by connectors extending from the first arm, one of said partition plates having means interengaging said elongated arm to nonrotatably hold the plate and another of said plates having means interengaging with each of said short arms to nonrotatably hold the plate.

2. In a counter unit, a shaft, a series of operatively connected numeral wheels mounted on said shaft, partition plates located between each pair of wheels, some of said partition plates having depending spaced lugs in vertical alignment with said shaft, and one of said partition plates having lateral spaced lugs on each side thereof in horizontal alignment with the shaft, a bracket including an elongated restraining arm having an outer free end positioned between said depending lugs, and a pair of short restraining arms positioned between said lateral lugs, said short arms being secured to said elongated arm by connectors adjacent the free end to provide a forward support for the bracket, and a vertical leg extending from the inner end of the elongated arm, said leg being mounted on the shaft to provide an inner support for the bracket.

3. In a counter unit, a shaft, means supporting the opposite ends of the shaft, a series of operatively connected numeral wheels mounted on said shaft, partition plates located between each pair of wheels, one of said plates having laterally spaced lugs extending from each side thereof in horizontal alignment with the shaft and the other plates having spaced lugs depending therefrom in vertical alignment with the shaft, a bracket for positioning said plates relative to one another and preventing rotation thereof, said bracket including an elongated restraining arm positioned between the depending lugs of said plates, a pair of short restraining arms positioned between the laterally extending lugs of the one plate, said short arms being secured to said horizontal arm by connectors whereby said side arms also provide a forward support for the bracket, a

end of the bracket and having an aperture through which said shaft extends to thereby support said end of the bracket, and means on said bracket engaging the means for supporting the shaft for holding said bracket against rotation.

4. An article of manufacture comprising a bracket of the character described having an elongated arm having a free end and a fixed end, a pair of short arms lying in a plane above the first arm and each secured thereto by a connector extending from the elongated arm adjacent the free end, and a vertical leg fixed to the other end of the arm and provided with an opening adjacent its upper end, and a finger extending rearwardly from each side thereof.

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