Jan. 8, 1957 G. C. ELLERBECK 2,776,795

EXTENDED TENS TRANSFER CONTROL MECHANISM

Filed July 27, 1953 2 Sheets-Sheet 1

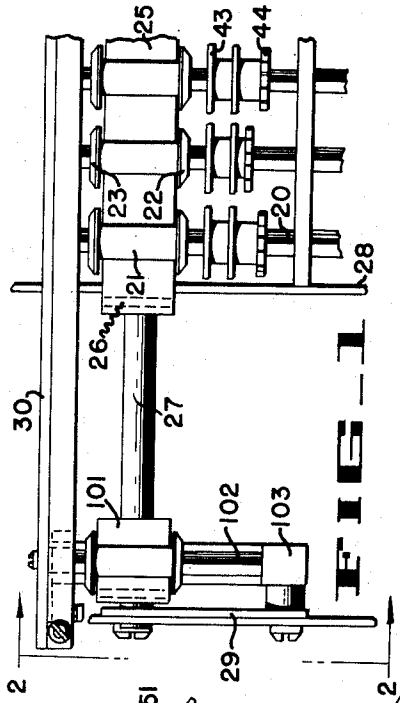


FIG. 1

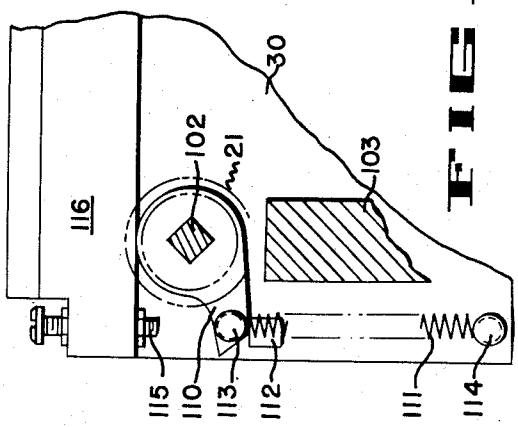


FIG. 3

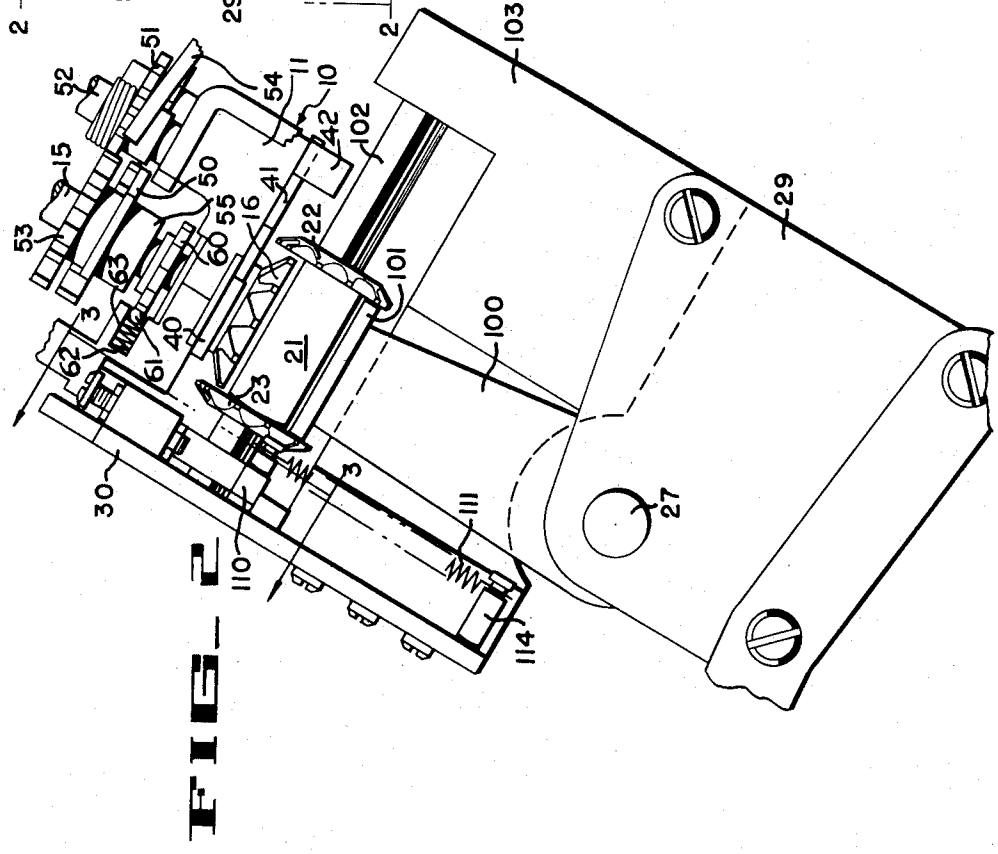


FIG. 2

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EXTENDED TENS TRANSFER CONTROL MECHANISM

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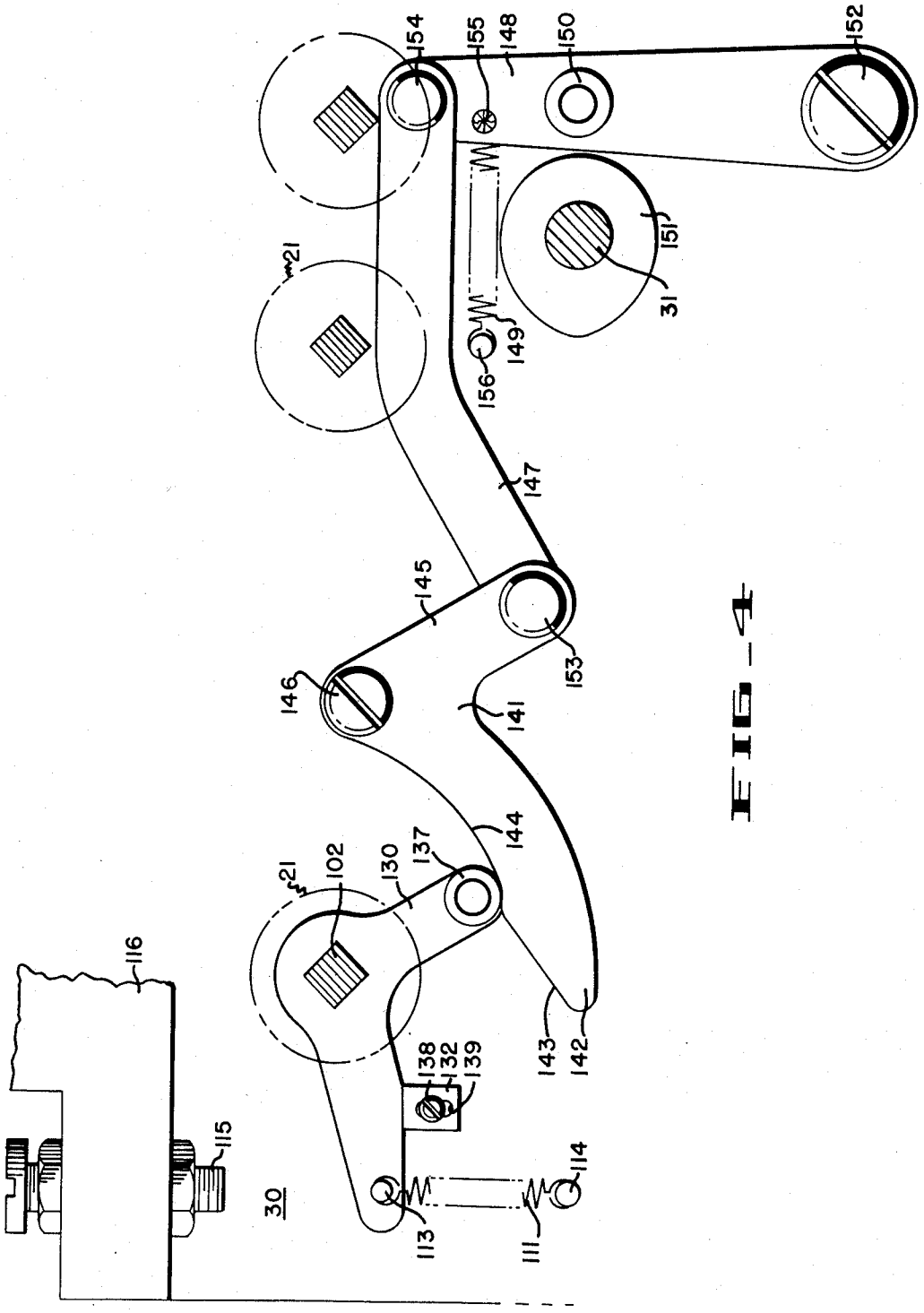


FIG. 4

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2,776,795

EXTENDED TENS TRANSFER CONTROL MECHANISM

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Application July 27, 1953, Serial No. 370,269

8 Claims. (Cl. 235—73)

This invention relates to an improvement for an auxiliary tens-transfer mechanism of the gear train type, such as illustrated by the patent to Machado et al. No. 2,597,507.

A primary object of the present invention is to provide an automatic centralizing device for the outboard orders of an auxiliary tens-transfer mechanism of the type described in said patent, thereby avoiding errors due to accumulated inaccuracies in the gear train resulting in overthrow or loss of a carry in the outboard orders.

Another object of the present invention is to provide a centralizing mechanism for the outboard orders of the register dials which is operative only when the actuators are engaged with the accumulator dials.

Another object of the present invention is to provide an auxiliary, or full, tens-transfer mechanism of the gear train type, such as illustrated in the afore-mentioned patent, in which the very exact tolerances in the gear train required in that form of transfer may be avoided.

It is conventional in commercial calculating machines, to utilize a keyboard having a capacity of eight or ten orders and an accumulator register having about twenty orders for the accumulation of values. In some commercial machines the respective orders of the accumulator are interconnected by planetary, or crawl-type, tens-transfer mechanisms which effect a full carry throughout the width of the accumulator. Other calculators, such as the commercial machine utilizing the gear train type of auxiliary carry illustrated in the above-mentioned patent, have cyclically operable, power driven tens-transfer mechanisms on the inboard orders of the machine. In such machines the passage of a register dial between the "0" and "9" positions, either additively or subtractively, sets a transfer gear in the next higher order of the machine in line with a single tooth tens-transfer actuator, the latter being power driven in timed relation to the actuating mechanism. Such a direct, power-driven transfer terminates adjacent the highest order of the keyboard: in the Friden machine with which the above-mentioned patent is related, in the 12th order for a ten-order keyboard. In the patent above-mentioned the higher orders of the register are provided with an auxiliary tens-transfer mechanism which includes a single tooth gear on each of the accumulator dial shafts, which gear engages an idler as the dial passes between the "0" to "9" positions. The idler gear in turn is meshable with a gear on the next higher order dial shaft, so that when the dial of the lower order passes between the "0" and "9" position, the next higher dial is moved a single step in the same direction. This train of gears is continued throughout the outboard orders of the register, i. e., from the 13th to the 20th orders in a twenty-order register. It is obvious that a train of gearing of this extent must be very accurately manufactured and very closely adjusted in order to insure the complete carry order of a unit from the 12th order of the register to the 20th order thereof, and the problem becomes worse with wear on the various portions of the gear train. I have found that the extreme accuracy required in the full carry, or auxiliary tens-transfer, mechanism of the said patent can be avoided, and all of the gears and other parts associated therewith can be manufactured on the basis of ordinary tolerances, if means is provided for centralizing the dial approximately half way between the 12th and 20th order in a full-cycle position, every time the auxiliary tens-transfer mechanism is operated. Even when such gears are made with considerable "sloppiness" the 4th outboard order dial will be moved at least a half step (18°), so that a centralizer at that order will be effective to move that gear a full step, but no more, and thus properly centralize the higher order gears as well. Thus, my invention relates to an improvement in the transfer mechanism of the patent above-mentioned, utilizing an automatic power-operated centralizing mechanism in the 16th or 17th orders of the register. I have found that gear trains manufactured according to usual standards will be effective to cause a tens-transfer for four orders, without losing it or without overthrowing, and if the intermediate dial is then centralized accurately in the full-cycle position, then the higher order dials are also held in accurate registration. Thus, a primary object of my invention is to provide an improved centralizing device for an intermediate outboard order of the register.

The present invention is concerned with these and other objects which will become apparent from the following description of the preferred embodiment of the invention, which is shown in the accompanying drawings in which:

Fig. 1 is a plan view of a more simple form of my invention.

Fig. 2 is a left end view of the mechanism of the first form of my invention, such as taken along a vertical plane indicated by the line 2—2 of Fig. 1.

Fig. 3 is a front view of the check arm of the first form of my mechanism, such as a view taken along the plane indicated by the line 3—3 of Fig. 2.

Fig. 4 is a front view of the power-operated mechanism of the second form, and preferred embodiment, of my invention utilizing the mechanism shown in Figs. 1 and 2, and substituting a power-operated mechanism for the devices shown in Fig. 3, being in effect a transverse vertical plane view such as taken along the line 3—3 of Fig. 2.

My invention is shown, for purposes of illustration, as embodied in a calculating machine of the kind described in the patent to Friden No. 2,229,889 as modified by the auxiliary tens-transfer mechanism of the patent to Machado et al. No. 2,597,507 above mentioned. The mechanism of the aforesaid patents are now well known and will not be described except insofar as is necessary of a full and complete understanding of my invention. The machines of said patents include a shiftable carriage 10 which includes a main frame bar 11 (see Fig. 2). The accumulator register is mounted in the carriage frame bar 11 and includes substantially vertical accumulator shafts 15 rotatably journalled therein. An accumulator gear 16 is affixed to the lower end of the dial shaft 15 and an accumulator dial, not shown, is mounted on the upper end of the shaft. The accumulator dials and shafts are driven by plus or minus gears 22 and 23, respectively, carried by a digitation control spool 21 that is slidably but nonrotatably mounted on a square shaft 20, the square shaft being given increments of rotation as described in said patents. Each shaft 15 is provided with a single tooth transfer cam 40 mounted on the lower end thereof adjacent the accumulator gear 16. A transfer lever 41 is rotatably mounted on the lower face of the frame bar 11, and is rocked by the passage of the cam 40 between the "0" and "9" positions, in either direction of rotation. The transfer lever 41 is provided with a down-

wardly extending ear **42** which lies between a pair of flanges **43** mounted on the hub of a transfer gear **44**, which is also slidably but nonrotatably mounted on the square shaft **20**. Thus, when the accumulator dial and shaft **15** passes between the "0" and "9" positions, in either direction of rotation, the transfer lever **41** is rocked to translate the transfer gear **44** and associated flanges **43** forwardly on the square shaft **20**. In this position the gear **44** is engaged by a single tooth transfer actuator gear (not shown), after which the transfer mechanism is returned to its normal position. This main transfer mechanism, being operated from the actuator shafts **31** (shown in Fig. 4) extends only through the inboard orders of the machine, which in the machine of said patents comprises a ten-order keyboard and ordinally associated actuators, and an additional actuator shaft **31** serving the 11th and 12th orders of the register. These transfer mechanisms can be referred to as the inboard, or main, transfer mechanisms and are effective throughout the orders of the carriage aligned with the ten orders of the actuators and two additional orders.

In order to extend the transferring of units from one order of the register to the next higher order thereof, in the orders higher than the 12th the machine is provided with an auxiliary transfer mechanism shown and described in the Machado patent above mentioned. This mechanism briefly comprises a single tooth transfer gear **50** rigidly mounted on the dial shaft **15** in the 12th order of the register, and a unitary transfer tooth and gear assembly for the 13th and all higher order dial shafts **15**. These assemblies include the single tooth gear **50** and a 10-tooth gear **53** formed on a single hub **55** which is affixed to the dial shaft **15**. As explained in said patent, in order to conserve space, the gear **53** is placed above the single tooth gear **50** in alternate orders and in the others the single tooth gear is placed above the 10-tooth gear **53**. The single tooth gears **50** are adapted to engage the teeth of a 10-tooth coupling gear **51** mounted on a spindle **52** mounted in the forward side of the carriage frame bar. Thus, whenever the dial passes between the "9" and "0" positions, the single tooth of the single tooth gear **50** meshes with the teeth of coupling gear **51**, giving it a single increment of rotation. The coupling gear **51** in turn meshes with the gear **53** on the next higher order dial shaft **15**, whereby rotation of the coupling gear **51** effects a similar rotation of the next higher order dial shaft. Thus, a transfer between one order and the next is accomplished through the single tooth gear **50**, coupling gear **51** and driven gear **53** on the next higher order. It is explained in said patent that the gears **51** and **53** are of sufficient width to enable the gear **51** to mesh with the driving gear **50** in one order and the driven gear **53** in the next higher order. Normally, the coupling gear **51** is biased into the plane of both the driven and the driving gears of the register, but are held in a disengaged position by means of a comb **54** in all operations of the machine except where operation of the auxiliary tens-transfer mechanism is necessary. This control is desirable in the commercial calculating machine, but as it is has no effect upon the operation of my invention, a description thereof will be omitted.

Each of the register assemblies including the shaft **15** and gear **16** is provided with a conventional detent means for centralizing each of the assemblies in a full digital position. The mechanism shown in Fig. 2, comprises a star wheel **60** fixedly mounted on the shaft **15**, the depressions of which are engaged by a resiliently biased ball **61** urged into engagement with the periphery of the star wheel by a suitable spring **62**, the ball and spring being seated in a bore **63** formed in the frame bar **11**.

In the mechanism shown in Figs. 1 and 2, values are set into the selection mechanism (not shown), after which a cyclically operated actuating mechanism (not shown) is effective to differentially rotate a square shaft **20** a differential amount determined by the setting of the selection mechanism. Rotation of the square shaft **20** rotates a digitation control spool **21** slidably but nonrotatably mounted thereon so as to control digitation into the accumulator register through operation of gear **16** and shaft **15**. Such a selection and actuating mechanism as is referred to herein, is fully shown and described in the Friden and Machado patents above-referred to and, as they form no part of the present invention, it has been deemed unnecessary to show and describe them here. It should suffice to mention that the spool **21** can be shifted longitudinally of its shaft **20** so as to cause meshing of a plus gear **22** or a minus gear **23** thereon with an accumulator gear **16**, as is more fully shown and described in said patents. The spool **21** is selectively positioned by means of a gear, or bail, **25** which is mounted on a pair of arms **26** which are rigidly secured to a transverse control shaft **27**. As explained in said patents the rocking of shaft **27** causes either the plus gears **22** or minus gears **23** to mesh with the accumulator gear **16**, and thus to control digitation additively or subtractively at the will of the operator. Normally the shaft **27** terminates at the left-hand frame plate **28**, which supports the left-hand side of the selection and actuating mechanism.

In my present invention I extend the control shaft **27** to the left so that the extreme left-hand end thereof is journalled in the control plate **29** at the extreme left-hand side of the machine. In the Friden machine with which my invention is particularly adapted to be associated, the 16th order of the register carriage lies immediately to the right of this plate when the carriage is in the extreme left-hand position. Rigidly secured to the shaft **27**, adjacent the control plate **29**, and in alignment with the 16th order of the register (when the register is in the extreme left-hand position), I provide an arm **100** (see Fig. 2) which is rigidly secured to the shaft **27**. This arm **100** is similar in size and length to the digitation control arms **26** previously mentioned. The upper end of the arm **100** is provided with a short bail **101** which is in alignment with the normal digitation control bail **25**. I also provide a short square shaft **102** whose longitudinal axis is in alignment with the 16th order register wheel, the rear end of the shaft being rotatably journalled in the back plate **30** which normally terminates at the frame plate **28**, but which in my invention is extended to the auxiliary or control plate **29**, and in a bracket **103** which is mounted on the left-hand control plate **29**. A digitation control spool **21**, similar in all respects to the digitation control spools previously mentioned, is slidably mounted on the square shaft **102**, the plus gear **22** and minus gear **23** thereon straddling the short gate **101**. Thus, when the shaft **27** is rocked to control digitation in the inboard orders of the machine, by means of rocking the conventional gate **25**, the short gate **101** is also rocked so that the digitation control spool **21** (in what would be the 16th order of the machine) is rocked into engagement with the superimposed accumulator gear in all respects the same as the spools **21** on the driving shafts **20**. Then, when a transfer is effected by the auxiliary transfer mechanism of the said Machado patent, the 16th order accumulator gear will rotate the digitation control spool of that order as the transfer goes through that order.

It can be noted that the greatest trouble in the auxiliary tens-transfer above-mentioned, lies in the overthrow of gears in the gear train as a result of the sharp rotation of the 13th order register dials, and all higher register dials in which a transfer will occur, upon the operation of the tens-transfer mechanism from the 12th order dial. Therefore, in most instances a satisfactory auxiliary tens-transfer mechanism can be secured by means which positively limit the rotation of the 16th order dial to 36°, or $\frac{1}{10}$ of a revolution, which corresponds to a transfer of a value of "1." In some instances it may be that inaccuracies in the gear train will cause a transfer to be

lost, and in that case I provide a means for forcibly pushing the transfer the full 36° once it is started, and mechanism for that purpose is shown in Fig. 4, which illustrates the second embodiment of my invention. For the moment however, we will refer to the means for blocking overthrow in the 16th order of the register dials.

A stop arm **110** is mounted on the square shaft **102** immediately to the rear of the auxiliary spool **21** that is slidably mounted on the shaft, as shown particularly in Fig. 3. The arm **110** is biased downwardly (counter-clockwise in Fig. 3) by means of a suitable spring **111** tensioned between a stud **113** on the stop arm **110** and a stud **114** on the rear frame plate **30**. The stop arm **110** abuts against a stop pin **112** which can be made adjustable as shown in Fig. 4, but which is shown in Fig. 3 as a fixed stop. It will be obvious that as the spool **21** on shaft **102** is translated forwardly or rearwardly in synchronism with the digitation spools **21** on the inboard orders of the machine, the spool on shaft **102** will engage with the aligned accumulator gear (in the 16th order of the machine as shown in the drawings) and the spool will therefore be rotated by the accumulator gear whenever a tens-transfer goes through that gear. Rotation of the spool is limited to $\frac{1}{10}$ of a revolution, or 36°, by means of an adjustable stop screw **115** mounted in a bracket **116** on the rear frame plate **30**. The engagement of the stop arm **110** with the end of the adjustable stop screw **115** therefore stops rotation of the spool **21**, and consequently of the aligned accumulator gear, after a $\frac{1}{10}$ revolution. This prevents an overthrow in the 16th order register dial. This not only prevents overthrow in the orders below the 16th, but also prevents overthrow in orders above the 16th amounting to more than a value of "1."

Thus, by means of the form shown in Figs. 1 to 3, my invention prevents overthrow in an intermediate outboard order, preferably about the 16th order, and thereby prevents an error arising from overthrow in the orders to the left thereof. It should be remembered that in the machine of said patents the actuators and the square shafts always rotate in a single direction (clockwise in Fig. 3). Therefore the stop arm **110** can be biased against stop pin **112** and rotatable to engage stop pin **115**, and will be effective in both addition and subtraction.

In some occasions it is desirable to modify the stop arm by providing power-operated means for forcing it, and consequently the shaft **102** and spool **21** mounted thereon, to the full 36° rotation when a transfer into the selected order is initiated. This form provides power-operated means for rocking the stop arm and its associated spool positively for 36° and there stopping rotation, thus driving the aligned register dial to a full step in a transfer operation, but limiting rotation to that step and blocking overthrow as in the previous form. The mechanism preferred for this power operation is shown in Fig. 4.

In the power-operated form shown in Fig. 4, the stop arm comprises a bellcrank **130** rigidly mounted on the shaft **102**, to the rear of the spool **21** mounted on that shaft. The bellcrank is biased, as was true of the stop arm **110**, by spring **111** tensioned between a stud **113** on the bellcrank and a stud **114** on the back plate **30**. Clockwise rotation of the bellcrank is limited by the adjustable stop **115** mounted in bracket **116** and counterclockwise rotation is blocked by an adjustable stop member **132** which comprises a block with a slot **139** embracing a screw **138** affixed to the back plate **30**. Thus, the stops **115** and **132** can be readily adjusted so as to provide for a full 36° of rotation of the bellcrank **130** and limited strictly to such 36° of rotation.

The other arm of the bellcrank **130** is equipped with a roller **137** which engages the leftwardly extending arm **142** of a bellcrank **141**. The bellcrank **141** is pivotally mounted on the rear plate **30** by any suitable means, such as screw **146**; and is provided with an arcuate upper surface **144** and a cam face **143** on the outer end thereof. The rightwardly extending arm **145** of the bellcrank **141** is pivotally secured to a link **147** by any suitable means, such as pin **153**. The right end of the link **147** is pivotally supported by a follower arm **148**, to which it is pivotally mounted by pin **154**. The arm **148** is mounted on the rear plate **30** by any suitable means such as screw **152**. The follower arm is provided with a follower roller **150** which is adapted to engage the periphery of a single rise cam **151** mounted on the actuator drive shaft **31** which serves the 11th and 12th orders of the machine. The arm **148** is biased (counter-clockwise in Fig. 4) into engagement with cam **151** by a tension spring **149** tensioned between a stud **155** on the arm and a stud **156** on the back plate **30**. The spring **149** is relatively strong so as to overcome the force of spring **111**, the spring **149** biasing the arm **148** toward the left and urging the bellcrank **141** in a clockwise direction. However, the arcuate edge **144** of the arm **142** is so designed that the force of spring **149** biasing the bellcrank **141** in a clockwise direction, is blocked by the roller **137** on the bellcrank **130** in all normal conditions of the register. When a transfer goes through the auxiliary mechanism mentioned to initiate a transfer into the 16th order, with consequent rotation of the spool **21** and shaft **102** from the latched position shown, bellcrank **130** is also rocked slightly (clockwise in Fig. 4). Thereupon the roller **137** passes from the blocking face **144** and into engagement with the cam face **143** on arm **142**. When this occurs rotation of the bellcrank **141** is no longer blocked and the bias of spring **149** will therefore rock the bellcranks **141** and **130** to their fullest extent, which is limited by engagement of the stop pin **115** engaging the arm of bellcrank **130**. Such rocking of bellcrank **141**, from the force of spring **149**, causes the cam face **143** to force the bellcrank **130** for its full stroke (clockwise in Fig. 4), thereby guaranteeing that the rotation of shaft **102**, the sleeve **21** mounted thereon and the aligned accumulator gear will be a full 36°. This mechanism thus provides a positive means for forcing the booster sleeve **21** to its full carry rotation of 36° while positively blocking overthrow in this order. Such a power-operated booster prevents a carry from being lost due to friction in any of the parts and loosely fitting gears and likewise positively prevents overthrow resulting from the normal rapid rotation of the auxiliary transfer mechanism.

In its preferred form my invention comprises a power-driven booster for an intermediate outboard order of the register, preferably about the 16th, which is operative to drive that register a full step to enter a value of "1," when the auxiliary transfer mechanism moves that register dial from its full-cycle position; and is effective to block rotation to prevent overthrow and thus limit the carry to a value of "1." This booster prevents a carry from being lost and also prevents error due to overthrow in the parts accumulating to throw more than a value of "1" in the highest order of the register. In my first described form I provide merely a block for preventing overthrow, as it has been found that this normally is the cause of errors in the auxiliary transfer mechanism mentioned.

It will be understood that the mechanisms shown and described herein are preferred embodiments of my invention and that the mechanisms shown are capable of considerable modification by persons skilled in the art without departing from the spirit and scope of this invention.

I claim:

1. In combination with a calculating machine having a frame, a shiftable carriage, a plurality of ordinally arranged register wheels in said carriage, certain of said wheels lying inboard of said frame and others of said wheels lying outboard thereof when the carriage is in its

end position, a main transfer mechanism for effecting transfers in the inboard register wheels, an auxiliary transfer mechanism mounted on said carriage for effecting transfers in the outboard register wheels, and a detent means for centralizing each one of said outboard register wheels in a full digital position, a normally disengaged stopping means mounted in said frame and engageable with an intermediate one of said outboard register wheels, and means for engaging said stopping means with an aligned register wheel during operation of the auxiliary transfer means.

2. In a calculating machine having a frame, an ordinally arranged and differentially operable actuating means mounted in said frame, a shiftable carriage, a plurality of ordinally arranged register wheels in said carriage, certain of said wheels lying inboard of said frame and others of said wheels lying outboard thereof when the carriage is in its end position, means for engaging said actuating means with the aligned register wheels, a main transfer mechanism for effecting transfers in the inboard register wheels, and an auxiliary transfer mechanism mounted on said carriage for effecting transfers in the outboard register wheels, the combination which comprises a normally disengaged stop member associated with an intermediate one of said outboard register wheels adapted to block operation of said wheel against rotation greater than a value of "1," and means operated simultaneously with said engaging means for connecting an ordinally aligned register wheel to said stop member.

3. In a calculating machine having a frame, a shiftable carriage, a plurality of ordinally arranged register wheels in said carriage, certain of said wheels lying inboard of said frame and others of said wheels lying outboard thereof when the carriage is in its end position, a main transfer mechanism for effecting transfers in the inboard register wheels, and an auxiliary transfer mechanism mounted on said carriage for effecting transfers in the outboard register wheels, a means mounted in said frame and operative in an intermediate outboard order for blocking rotation of the register wheel in said outboard order to an amount greater than a value of "1."

4. In a calculating machine having a frame, a shiftable carriage, a plurality of ordinally arranged register wheels in said carriage, certain of said wheels lying inboard of said frame and others of said wheels lying outboard thereof when the carriage is in its end position, means for entering values into said inboard register wheels including digitation control gears cooperative with certain inboard register wheels and control means for selectively engaging said gears with the ordinally related register wheels, a main tens-transfer mechanism for effecting transfers in the inboard register wheels, and an auxiliary tens-transfer mechanism mounted on said carriage for effecting transfers in the outboard register wheels, said last-named means including a transfer tooth connected for movement with the highest order inboard wheel and each of the outboard wheels, a transfer gear on each of the outboard wheels, and a series of coupling members for operatively connecting each transfer tooth with the transfer gear in the next higher order of the register so as to enable the transfer of a unit from one order to the next to be effected throughout the entire array of register wheels, an outboard control gear cooperating with a selected intermediate outboard order wheel, means for engaging said outboard control gear with the ordinally related register wheel synchronously with the operation of the control means, and means for limiting the extent of rotation of said outboard control gear.

5. In a calculating machine having a frame, a shiftable carriage, a plurality of ordinally arranged register wheels in said carriage, certain of said wheels lying inboard of said frame and others of said wheels lying outboard thereof when the carriage is in its end position, engageable actuators for certain of said inboard register wheels, means for engaging said actuators with said inboard register wheels, a main transfer mechanism for effecting transfers in the inboard register wheels, an auxiliary transfer mechanism mounted in said carriage for effecting transfers in the outboard register wheels, and means for positively entering a value of "1" into an intermediate outboard order of said register comprising an actuator member in said intermediate outboard order, power means for operating said actuator, means for latching said power means against operation, stop means for limiting operation of said actuator to a value of "1," means for moving said actuator member into engagement with the ordinally aligned register simultaneously with operation of the engaging means, and means operated by rotation of said outboard register wheel for releasing said latching means.

6. In a calculating machine having ordinally arranged and differentially operable drive means, a shiftable carriage, a plurality of ordinally arranged register wheels in said carriage, certain of said wheels lying inboard of said drive means and others of said wheels lying outboard thereof when the carriage is in its end position, means for engaging said drive means with the ordinally aligned register wheels, a main transfer mechanism for effecting transfers in the inboard register wheels, and an auxiliary transfer mechanism mounted in said carriage for effecting transfers in the outboard register wheels, means for limiting overthrow in an intermediate outboard order of said register comprising an actuator member in said intermediate outboard order, means for moving said actuator member into engagement with the ordinally aligned register simultaneously with operation of the engaging means and stop means for limiting rotation of said actuator member to a value of "1."

7. In a calculating machine having ordinally arranged and differentially operable actuating means, a shiftable carriage, a plurality of ordinally arranged register wheels in said carriage, certain of said wheels lying inboard of said actuating means and others of said wheels lying outboard thereof when the carriage is in its end position, a main transfer mechanism for effecting transfers in the inboard register wheels, and an auxiliary transfer mechanism mounted in said carriage for effecting transfers in the outboard register wheels, the combination which comprises a booster member engageable with an intermediate outboard order of said register, means for engaging said booster with an aligned register wheel, power means for rotating said booster, means for limiting such rotation to the entry of a single value, means for latching said power means against operation, means for releasing said latching means whenever the aligned dial is rocked as a result of a transfer.

8. In a calculating machine having ordinally arranged and differentially operable drive means, a shiftable carriage, a plurality of ordinally arranged register wheels in said carriage, certain of said wheels lying inboard of said drive means and others of said wheels lying outboard thereof when the carriage is in its end position, a main transfer mechanism for effecting transfers in the inboard register wheels, and an auxiliary transfer mechanism mounted on said carriage for effecting transfers in the outboard register wheels, a power-operated actuator cooperating with a predetermined intermediate order of said outboard register wheels, latching means for said actuator, and means operated by a partial rotation of said intermediate order register wheel for disabling said latching means.

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