June 12, 1951

J. LYDFORS
SELECTIVELY OPERABLE SHIFTABLE
TOTALIZER ARRANGEMENT

2,556,762

Filed Jan. 20, 1948

2 Sheets-Sheet 1

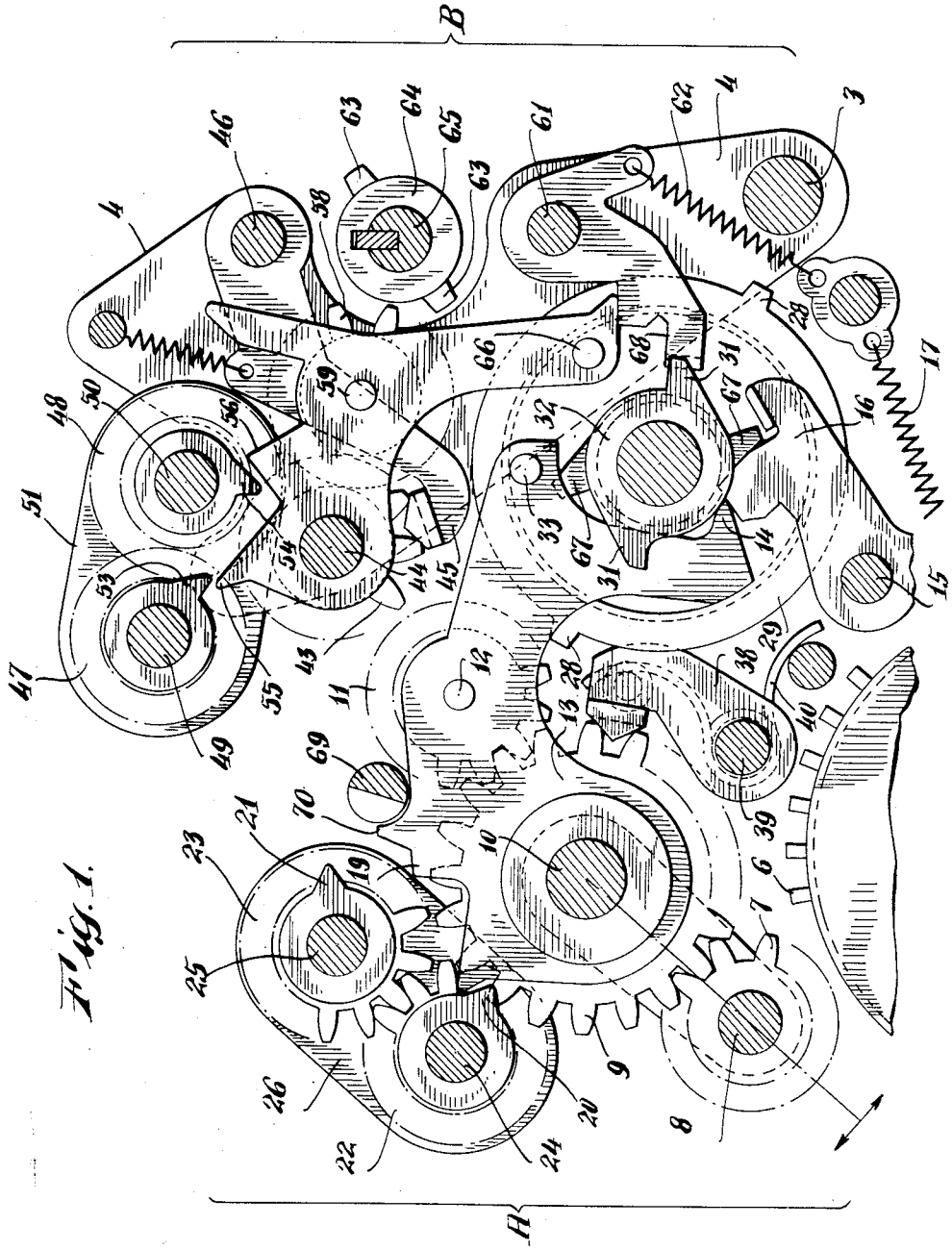


Fig. 1.

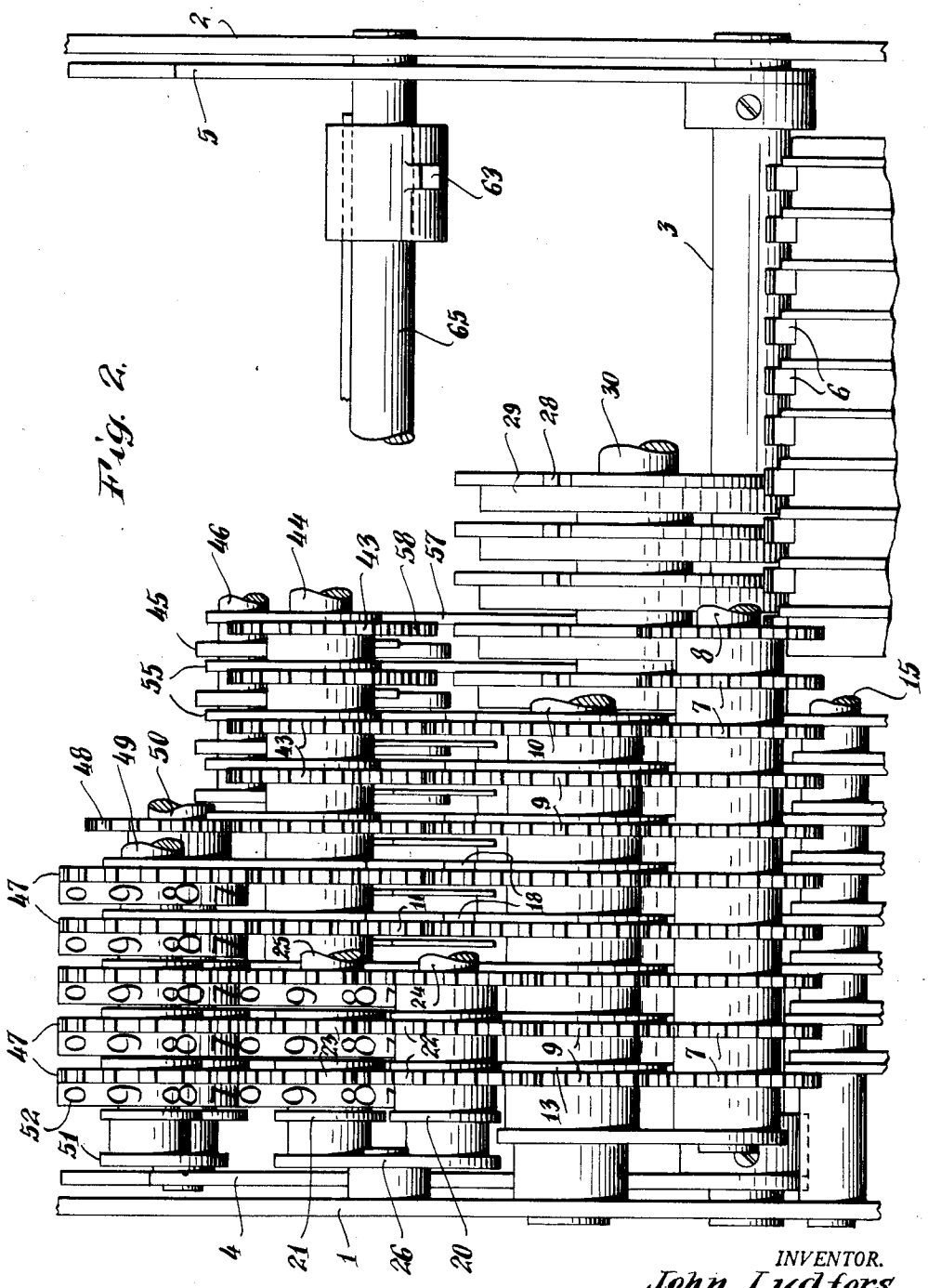
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Filed Jan. 20, 1948 2 Sheets-Sheet 2

Fig. 2.



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Patented June 12, 1951 2,556,762

UNITED STATES PATENT OFFICE

2,556,762

SELECTIVELY OPERABLE SHIFTABLE TOTALIZER ARRANGEMENT

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Application January 20, 1948, Serial No. 3,358
In Sweden October 12, 1946

Section 1, Public Law 690, August 8, 1946
Patent expires October 12, 1966

3 Claims. (Cl. 235—79)

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The present invention refers to an arrangement in calculating machines and the like comprising two or more calculating mechanisms. The object of the invention is to provide a calculating machine, wherein one of the calculating mechanisms is adapted by a single shift selectively to operate as a quotient register and as an accumulator. In the latter case the result is introduced directly into the accumulator through a result mechanism. The invention is principally distinguished by the feature that two or more calculating mechanisms are adapted to cooperate with a common device for tens transfer.

The accompanying drawings illustrate an embodiment of the invention, wherein a result calculating mechanism may be caused to cooperate with a combined accumulator and quotient register. Fig. 1 shows the members in a section at right angles to the shafts of the calculating mechanism. Fig. 2 is a partly cut front view of the same members.

The calculating mechanisms are arranged between two rigidly arranged frame walls 1 and 2 (Fig. 2), the wall 1 constituting the left-hand head wall and 2 the right-hand head wall of the mechanism. The shafts of a result mechanism A are mounted in these walls in a manner known per se. Furthermore, a shaft 3 is mounted at the end portions thereof in these walls, said shaft constituting a rotary shaft for the combined accumulator and quotient register B, the shafts of which are mounted in two wall sections 4 and 5 parallelling the frame walls and rotatable about the shaft 3.

Fig. 1 shows a rotor of the result mechanism formed in a manner known per se, said rotor being provided with the read-in pins 6. The adjustment of the latter from an inoperative into an opertaive position may be effected in any suitable manner and has no bearing on the inventive idea. Said read-in pins cooperate during the rotary movement of the rotor with a gear wheel 7. The number of pins 6 as well as the gear wheel 7 which are provided in the machine is in accordance with the capacity of the machine. This is also the case with the other members shown. In the following, only the members for one order are considered. The gear wheel 7 is rotatable about a shaft 8. This shaft may either be fixedly mounted or arranged to be displaced by a translatory movement, so that the gear wheel 7 can be brought out of and into the path of the read-in pins 6. However, the gear wheel 7 is in a constant driving connection with a gear wheel 9 arranged as a sun wheel, which is mounted on a

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shaft 10. Functioning as a planet wheel to said sun wheel is a gear wheel 11 which, while being rotatably arranged on a shaft journal 12, is secured in an arm 13 swingable about the shaft 10. The outer end portion of said arm forms a tooth 14 cooperating with a positioning and locking arm 16 mounted on a shaft 15, so that the arm, and thus the planet wheel, may take two fixed positions. A spring 17 tends to turn the locking arm in a counter-clockwise direction. The planet wheel carrier, that is to say the arm 13, is formed near its bearing shaft 10 with two lugs 18 and 19 adapted to cooperate each with one tens transfer cam 20 and 21 respectively. The cam 20 is connected with a calculating wheel 22, while the cam 21 is arranged on a calculating wheel 23. Shafts 24 and 25 of these wheels are mounted in a cradle device 26, in a manner such that the gear wheels may be alternately brought into driving connection with the sun wheel 9, these gear wheels thus actuating the arm 13 with their transfer cams 20 and 21, for the purpose of shifting the arm 13 by an angle in a clockwise direction from the position shown. According to the example, the calculating wheel 22 is shown in its operative position, the transfer cam 20 at the rotary movement of the wheel displacing the lug 18 on the arm 13 out of the path of said cam. The calculating wheels 22 and 23 are intended to be brought into an operative position, one for positive and the other for negative calculating operations.

In the position shown in Fig. 1, the arm 13 is about to be shifted from the position shown to locking engagement with the locking arm 16, the teeth of the planet wheel 11 being then moved into the path of a transfer tooth 28 on a transfer drum 29. This drum is mounted on a shaft 30 and adapted to rotate in synchronism with the drum or rotor carrying the read-in pins 6. After the transfer tooth has been brought into engagement with a tooth on the planet wheel 11, and has entrained this wheel by a tooth pitch, so that the sun wheel has also been advanced by one step so as to cause a tens transfer in the calculating mechanism 22 and 23 respectively, the arm 13 is returned into the initial position by cooperating with one of two lugs 31 arranged diametrically relatively to each other on a hub portion 32 rigidly connected with the transfer drum 29 and a pin 33 on the arm 13. Prior to the return movement, the other lug 31 actuates the locking arm 16 and moves the latter into a position in which the tooth 14 is released. A positioning member 37 constitutes the end portion of an arm 38,

which is swingable about a shaft 39 and adapted to bear on the teeth of the sun wheel under the influence of a spring 40. For the purpose of reading the calculating mechanism, the calculating wheels 23 are provided with indicators 23', which always indicate the correct result, inasmuch as the two calculating wheels 22 and 23 are in mesh with one another.

The combined accumulator and quotient register B is built broadly on the same principle as the result calculating mechanism A. The most conspicuous difference resides in that the calculating mechanism B is in its entirety swingable about the shaft 3, as stated hereinabove, for the purpose of securing a tooth engagement between the planet wheel 11 of the result mechanism and a gear wheel 43 operating as a sun wheel in the mechanism B, in correspondence with the sun wheel 9 of the mechanism A. This wheel 43 is mounted on a shaft 44 and cooperates with a positioning arm 45, which is swingable about a shaft 46. The wheel 43 is always in mesh with one of two mutually coupled calculating wheels 47 and 48, the shafts 49 and 50 of which are mounted in a cradle device 51. The latter is swingable about a shaft (not shown), which is in turn mounted in the wall sections 4 and 5 swingable about the shaft 3, said wall sections also carrying the shafts 44 and 46. According to the example, the calculating wheel 47 is adapted to enter into tooth engagement with the wheel 43 at a positive calculating operation, while the calculating wheel 48 is operated in the same manner, at a negative operation. According to Fig. 1, the calculating wheel 48 is shown in engagement with the sun wheel 43. The calculating wheel 47 is provided with an indicator 52, and both calculating wheels are provided with transfer cams 53 and 54, respectively, which are adapted to cooperate with lugs 55 and 56, respectively, on a transfer arm 57 swingable about the shaft 44. A planet wheel 58 mounted on a pin 59 on said transfer arm 57 is in constant engagement with the wheel 43 and adapted at the shifting of the transfer arm 57 by means of the cams 53 and 54 of the respective calculating wheels to be moved into operative position for the transfer tooth 28 on the above-named transfer drum 29. The tens transfer consequently takes place, in principle, in the same manner as in the calculating mechanism A. The transfer arm 57 is kept in its operative or inoperative position by means of a combined positioning and locking arm 60, which is swingable about a shaft 61 and actuated by a spring 62.

In the position shown for the planet wheel 58, the latter cooperates with two mutually diametrical quotient teeth 63 on a rotor 64, which is driven by means of a shaft 65 mounted in the frame walls 1 and 2. Here, the calculating mechanism 47, 48 operates as a quotient register with a complete tens transfer. The returning of the transfer arm 57 from the position to which it is shifted by means of one of the cams of the calculating wheels 47 and 48, and in which position the planet wheel 58 is actuated by the transfer teeth 28, back into the position shown in the drawing is effected with the aid of the same cam members, which return the transfer arm 13 in the result mechanism A, that is to say the cams 31 on the hub portion 32 of the transfer drum 29, which cams are thus caused to enter into engagement with a pin 66 on the outer end of the transfer arm. Just prior to such return, however, the locking arm 60 will have to be moved into inoperative position, which is effected with the aid of two diametrically opposed cams 67 on the hub 32, which cams are thus caused to enter into engagement with a tongue 68 on the arm 60. As will appear from the calculating mechanism described, the transfer drum 29 and the quotient rotor 64 are intended to become operative twice per revolution, which is obvious from the doubled and mutually by 180° displaced members on said parts.

Normally, the mechanism B functions as a quotient register. On the other hand, said mechanism may any time be caused to function as an accumulator, by swinging the mechanism about the shaft 3, so that the sun wheel 43 enters into tooth engagement with the planet wheel 11 of the result mechanism A. The planet wheel 58 is then moved out of the path of the quotient tooth 63, while the other functions of the mechanism B remain unchanged. Thus the mechanism B still operates with a complete tens transfer through its connection with the transfer drum 29 common to both mechanisms. When the result mechanism A is zeroised, the result may be introduced into the mechanism B through said mutual coupling of the two mechanisms. During this process, the transfer arms 13 are locked in the mechanism A, which is effected with the aid of an eccentric contrivance which, according to the example shown, is constituted by a semicylindrical portion 69 of a rotatably mounted shaft, which portion may be adjusted into locking position for a tongue 70 on the transfer arm 13.

It should be obvious that, since the two mechanisms are adapted to be coupled to each other, facilities are provided for the simultaneous introduction of an amount into both mechanisms and not only for an introduction into the mechanism B at zeroising of the mechanism A, as indicated above. Finally, it should be pointed out that the mechanism B can be mounted swingably otherwise than above described, for instance with the aid of guides, toothed racks and the like.

I claim:

1. In a calculating machine, the combination with a first fixed totalizer, having an actuator drum associated therewith, of a second totalizer, of a ten-carry mechanism and of a rotor with actuating lugs for revolution counting, the second totalizer being movable to and from positions where it co-operates either with said first totalizer or with said rotor, a set of transmitting means for ten-carrying in the first totalizer, a set of transmitting means for ten-carrying in the second totalizer, said two sets of transmitting means co-operating with said ten-carry mechanism.

2. The combination claimed in claim 1, wherein said transmitting means for ten-carrying for each totalizer comprises a spur gearing selectively meshing with the ten-carry mechanism, the first totalizer having a second spur gearing selectively meshing with said actuator drum, and the second totalizer being movable from an inoperative position to an operative position of engagement with said spur gearing of the first totalizer.

3. The combination claimed in claim 2 wherein the spur gearing of the second totalizer is mov-

able between positions of engagement respectively with said rotor for revolution counting and with said ten-carry mechanism.

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