



PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Improvements in Calculating Machines having Totalizer and Setting Members arranged around a Central Driving Member

I, CURT HERZSTARK, of Feldkirch, Vorarlberg, Austria, a Citizen of Austria, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to calculating machines of the type having totalizer and setting members arranged around a central driving member, and the totalizer carriage of which is at each decadal shift displaced axially and is brought to rest after being turned into the new operative position.

In the known calculating machine of the type referred to in its smallest form, the totalizer carriage is supported at the inner part of the stationary machine body and the engagement of the totalizer carriage in rests is effected by one or more pins in the machine body engaging in radially extending recesses of the body of the totalizer carriage. These recesses serve the main purpose of fixing the numeral drum shafts which radiate in a star-like manner and with their free ends form the carriers for the outer containing ring of the carriage, with which the latter is manipulated, when calculating with the machine.

Owing to the circumstance, that the support and fixing of the totalizer carriage is placed towards the inside, the described mode of construction of the totalizer which is of itself very simple and suitable for the purpose, suffers from a number of disadvantages.

It may thus happen, that through rough treatment of the totalizer carriage, for instance by heavy pressure on its closing ring forming the handling means, an elastic bending of the numeral drum shafts may occur, as it is only through these shafts that the manipulating force is taken up by the support of the carriage.

Such occurrences may detrimentally affect the calculating accuracy.

If, moreover, in producing the radial recesses in the carriage body small pitch errors should occur, the result of such an error which naturally increases radially outwards is, that the position of the tens-transfer pins of the numeral drums mounted at the shaft

ends with respect to the tens-transfer members guided in the outer rim of the machine body and influenced by the tens-transfer pins will not be quite correct. In this case it may occur, that the tens-transfer pin will not accurately strike against the tens-transfer member (slide) and thus prejudice the calculating accuracy of the machine.

The same disadvantage will occur, when the fixing pin which is of necessity fairly near the centre axis of the machine in the machine body engages with a slack fit in one of the recesses containing the numeral drum shafts, that in this case as well a not quite correct position between the tens-transfer pin and the tens-transfer member influenced by it may result.

A further disadvantage consists in this, that the fixing pin and the supporting surface for the totalizer carriage are fairly inaccessible and the production of the correct height of the supporting surface requires very high precision manufacture.

Now, in order to avoid an elastic bending out of truth of the numeral drum shafts through rough handling of the carriage, it has been proposed to place the support of the latter quite at the outer rim of the machine body. This expedient is employed in a calculating machine having a horizontal main driving shaft and being provided with a cylindrical casing concentric with the said shaft, within which casing the shafts of the numeral rollers of the totalizer are arranged in an arc around the main driving shaft and parallel thereto, the said shafts being adapted to be connected with or disconnected from the shaft of the actuators and the totalizer carriage being supported by its outer casing edge against the casing of the machine. According to this U.S. specification it is also not new per se to provide catches for the totalizer carriage at the outside.

The essential feature of the present invention consists in this, that the slots provided at the outer rim of the machine body, in which the tens-transfer members (slides) directly influenced by the tens-transfer pins of the numeral drums are guided, form the stop catches for the totalizer carriage. Through this arrangement any bending of

the numeral drum shafts is excluded, even when the counting mechanism carriage is roughly handled, as the manipulating forces are kept away from the numeral drum shafts and are taken up directly by the machine body. Furthermore, even should there be any small pitch errors in the radial recesses of the counting mechanism carriage body, in which the numeral drum shafts are supported, the correct position of the transmission and control members to one another in every tens-position of the counting mechanism carriage is assured, owing to the circumstance, that the guiding slots of the tens-transfer members at the same time form the stop elements for the carriage.

In the drawing two constructional examples of the invention are illustrated.

Fig. 1 showing a portion of such a calculating machine with the arrangement according to the invention in side elevation partly in section.

Fig. 2 a horizontal section along line II—II of Fig. 1.

Fig. 3 a part section along line III—III of Fig. 5.

Fig. 4 a part section along line IV—IV of Fig. 5, and

Fig. 5 a horizontal section partly along line V—V and partly along line VI—VI of Fig. 3 or Fig. 4 of the arrangement according to the invention in the second constructional form.

Of the calculating machine only as much is shown, as is necessary for understanding the invention.

1 is the base of the calculating machine which contains the known driving mechanism and the setting mechanism. In the base the upper part of the fixed machine body 2 is seen in section. On the collar-like extension 3 of the same the circular carriage 4 is supported by means of a sleeve 5 so as to be capable of rotation and axial displacement. In the circular carriage 4 all parts of the result counting mechanism and the revolution counting mechanism are housed, of which there are shown in the drawing only a numeral drum 6, the transmission pinion 7 connected with it and the shaft 8, on which these parts are mounted. The shafts 8 are fixed in radial recesses 9 of the circular carriage body and support at their free outer ends the ring 10 which forms the lateral termination of the totalizer carriage and the manipulating means for its displacement.

In the drawing is also to be seen a tens-transfer slide 11 which is influenced by the tens-transfer pin 12 of the numeral drum 6 immediately above it. The tens-controlling slides 11 are guided in slots 13 of the upper flange 14, which are open towards the periphery of the machine body, and of the lower

flange (not shown in the drawing) of the machine body 2 in a known manner.

According to the invention the slots 13 at the same time form the stop catches for the totalizer carriage, on which is provided the stop part 15 which engages with as little clearance as possible in one of the slots 13.

The stop part 15 consists in the constructional example illustrated of an inwardly projecting lug of a ring 16 which is inserted in a recessed part of the closing ring 10 and is held in position by a locking ring 17. The ring 16 has besides the stop part 15 further lugs 18 spaced apart at a definite distance, which however engage with clearance in the slots 13. The lugs 18 only form the support, whilst the stop part 15 also acts as a support. In order that the totalizer carriage with the lugs 15, 18 shall rest directly on the outer rib of the machine body, a ring 19 is fixed to the underside of the flange 14.

As for the sake of lightness of the machine the body 2 of the machine is made of light metal, the ring 19 is made of harder material.

According to the second constructional form the lateral closing ring 10 is provided with a flange 22 which is directed inwards at right angles and with which the totalizer carriage rests on a step of the flange 14 of the machine body 2. The stop part for acting as a catch for the totalizer carriage consists of a ring 23 which with an inwardly directed lug 24 engages with as little clearance as possible in one of the slots 13 in the flange 14 of the machine body 2. The ring 23 is open and resilient, so as to enable it to be inserted in a slightly compressed state into the recessed part 25 of the closing ring 10. The ring 23 is secured in the ring 10 in any suitable manner to prevent it turning. In place of the spring ring 23 the flange 22 may be provided at the bottom at one place with a projection which engages without clearance in the slots 13.

It should be mentioned, that in both constructional examples the parts of the stopping and supporting arrangement are invisible from the outside.

Through the described arrangements the advantages mentioned above over the known carriage support and carriage fixing means are realised.

In the shifting forward of the totalizer carriage by tens the carriage is lifted out against the action of the compression spring 20, so that the pinions 7 of the numeral drums 6 come out of engagement with the pinions 21 of the transmission mechanism. Simultaneously the stop part 15 and the lugs 18 are disengaged from the slots 13, whereupon by turning the carriage the displacement by tens of the totalizer is carried out.

Owing to the circumstance, that only the

stop part 15 effects the fixing of the totalizer carriage, the accurate setting of the carriage is made easier than if the locking were effected by all three lugs 15, 18.

5 The manner, in which the arrangement according to Figs. 3 to 5 operates, when shifting the totalizer carriage forwards, is the same as described above.

What I claim is:—

10 1. A calculating machine having totalizer and setting members arranged around a central driving member, the totalizer carriage being disengaged by axial displacement from the transmission mechanism and its stopping
15 means and by subsequent turning fed forward to the next denomination, characterised by the feature, that the guiding slots provided at the outer rim of the machine casing for the
20 tens transfer members influenced by the tens transfer pins of the numeral drums form also the stop catches for a stop part provided on the totalizer carriage, the part of the outer rim of the machine body, which bounds the stop catches, acting as support for the totalizer carriage.

25 2. A calculating machine as claimed in Claim 1, characterised by the feature, that in the enclosing ring of the totalizer carriage there is inserted a ring provided with inwardly projecting lugs, of which one fits as
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a stop part accurately into the slots, whilst the others engage with clearance and all the lugs form the supporting means for the carriage.

3. A calculating machine as claimed in 35 Claims 1 and 2, characterised by the feature, that the slots of the machine casing are covered at the bottom by a ring, on which the totalizer carriage rests with the lugs.

4. A calculating machine as claimed in 40 Claim 1, characterised by the feature, that the totalizer carriage is supported by means of an inwardly directed flange on the flange of the machine casing.

5. A calculating machine as claimed in 45 Claim 4, characterised by the feature, that the stop part of the carriage forms the inwardly directed projection of an open spring ring which is inserted into a recessed part of the totalizer carriage.

6. A calculating machine as claimed in 50 Claim 4, characterised by the feature that the flange on the enclosing ring is provided with a stop lug which engages in one of the slots of the machine body.

7. The improved calculating machines 55 substantially as hereinbefore described and as illustrated in and by the accompanying drawing.

MARKS & CLERK.

This drawing is a reproduction of the Original on a reduced scale.

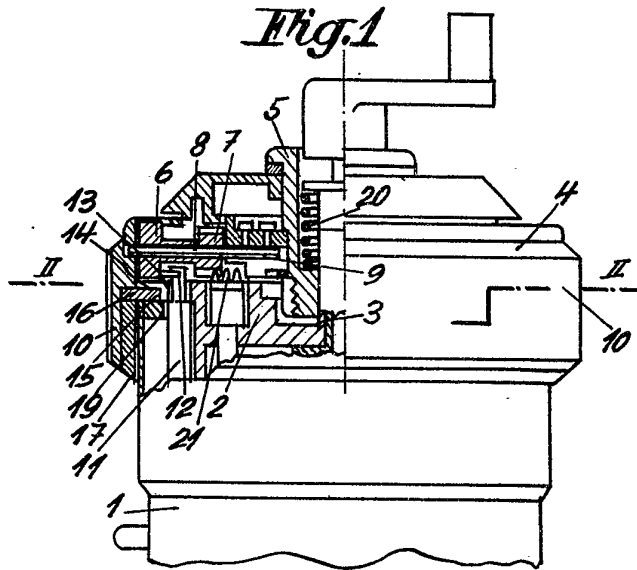


Fig. 2

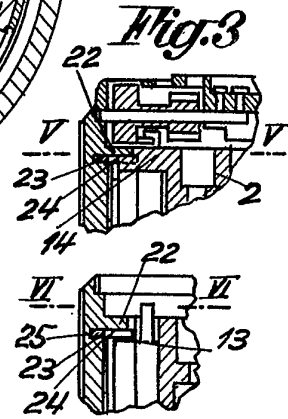
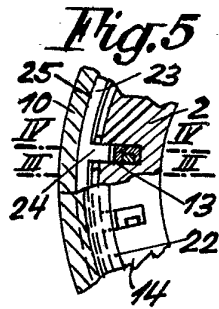
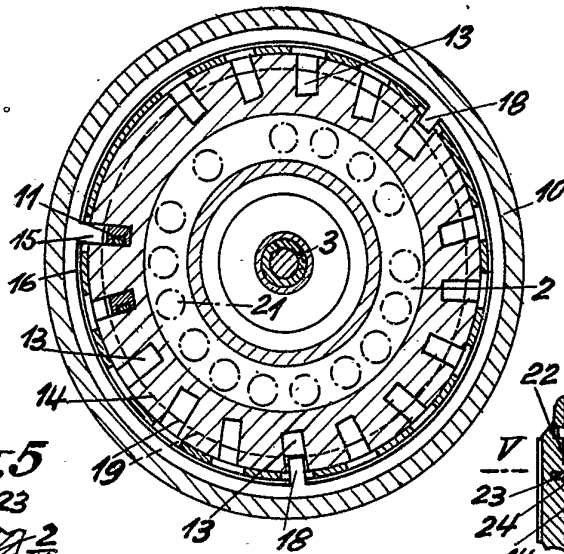


Fig. 4