# PATENT SPECIFICATION

## 751,420

## COMPLETE SPECIFICATION

## Calculating Device

I, REINHARD ANTON SANDER, of Learmonth, in the State of Western Australia, Commonwealth of Australia, British Subject, do here-
5 by 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 a calculating
10 device.

The object of the invention is to provide a calculating device which is simple in construction and easy to operate.

The invention will readily be understood by
15 reference to the accompanying drawings showing a form thereof largely diagrammatic. In these drawings: —

Figure 1 is a plan view of the device: —

Fig. 2 is an elevation thereof as it would
20 appear if the sides were transparent, whilst: —

Fig. 3 is a view of the four logarithmic scales.

As shown in the drawings, there are two scales 10 and 11 graduated in logarithmic
25 proportions and marked from 1.0 to 10.0 in the same direction. These two scales are each marked on a circle and they are relatively spaced some distance apart but are relatively immovable. That is to say, they cannot be
30 moved in relation to each other but they can be moved as a whole.

There are also scales 12 and 13 graduated in logarithmic proportions from 1.0 to 10.0 but these are graduated in opposite directions
35 and the scales are placed in the circumferential space left between the scales 10 and 11.

The scales 12 and 13 are relatively immovable to each other, but they can be moved together. This of course means that the scales
40 10 and 11 can be moved together circumferentially in either direction and that the scales 12 and 13 can be moved circumferentially together either in one direction or the other.

The part of the scales 10 and 11 indicat-
45 ing the 1.0 mark or the 10.0 mark is provided

with a result pointer 14 and 15 respectively.

The cover of the device is indicated at 16. Beneath it there is a screen 17 of approximately quadrant form provided with a multiplication marking 18 which can register with 50 a corresponding opening inset with a magnifying glass in the cover 16. When in such position, the multiplication marking has a gap along its upper portion to expose scales 10 and 12 and this gap is bisected by a sighting line 55 19.

The screen 17 also has a division marking 20 and a gap or opening which is the lower part of this marking to expose scales 11 and 13, and this gap or opening is bisected by a 60 sighting line 21. The screen 17 is provided with an extension 22. This extension 22 enables the screen to be moved to expose the multiplication scales as shown in the drawing, or to show the division scales. 65

In the casing of the device there are placed two rotatable members 23 and 27. In Fig. 2 for the sake of clearness these are shown separated to some extent but in practice one rests on the other and has frictional contact with 70 it. The rotatable member 23 is provided with bevel gear teeth 24 and this is adapted to be engaged by a bevel pinion 25 from which a shaft extends and can be rotated by a thumb or finger piece 26. By a slight inner movement, 75 the pinion 25 can be released from the gear teeth 24 or conversely.

The rotating member 27 also has bevel gear teeth 28 which can be engaged by a bevel pinion 29 which through a shaft communicates 80 with a thumb or finger piece 30. The scales 10 and 11 are supported on the rotatable member 27 and the scales 12 and 13 on the rotable member 23. The former is connected to a pinion 31 which is engaged by a rack 32 that, 85 as the member 27 rotates, is moved to one side or the other. It can either be brought back to the central position by the operation of a rod 33 terminating in a hand piece 34 by means of a series of linkages operating 90

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arms 35 and 36 which come together against the ends of the rack 32 and bring it back to the central position. In this central position the result pointers 14 and 15 are in line with 5 the sighting line 19 of the multiplication indicator or 21 of the division indicator.

If multiplication is to be effected with the device, the screen 17 is brought to the position shown in Fig. 1 to expose scales 10 and 10 12. Thereafter the scale 12 is moved by means of the finger or thumb piece 26 operating the pinion 25 until the one multiplier is brought in line with the sighting line 19. Thereafter, the scale 10 is moved until the second multi- 15 plier is brought in line with the sighting line 19. Then, by pulling the hand piece 34, the arms 35 and 36 come together, bring the rack 32 to the central position, and so bring the rotatable member 27 back to the initial 20 position so that the scales 10 and 11 are placed so that the result pointer 14 is in line with the sighting line, and the answer is then read on the scale 12.

It is to be understood that the bringing 25 back of the scales 10 and 11 to the central position does not disturb the relative position between these two scales and the scales 12 and 13 because the rotating member 23 which supports the scales 12 and 13 is brought around 30 by friction against the member 27 on which it actually rests.

What I claim is:—

(1) A calculating device which has four concentric scales graduated in logarithmic pro- 35 portions of the same basic unit, the first pair of the scales being relatively immovable and with the graduations increasing in the same direction, the second pair of scales also being relatively immovable and with the graduations increasing in opposite directions, the two 40 pairs of scales being movable relative to each other, one scale of the first pair with one scale of the second pair enabling multiplication, and the other scale of the first pair with the other scale of the second pair enabling divi- 45 sion to the carried out, a plate adapted to cover the scales and having an opening therein, and a movable screen fitted between the cover plate and the scales so that in one position part of the opening in the cover plate is obscured 50 and only the two scales required for multiplication are exposed and in another position only the two scales required for division are exposed.

(2) A calculating device as claimed in claim 55 1, wherein the first pair of scales are each provided with a result pointer in the initial position.

(3) A calculating device as claimed in Claim 2, in which each pair of scales is mounted 60 on a disc or rotatable member adapted to be rotated by a pinion and including means for returning the first pair of scales to the initial position without disturbing the relative position of the two scale supporting discs or rotat- 65 able members.

(4) A calculating device substantially as herein described and as shown in the accompanying drawings.

Dated this 21st day of May, 1954.
For the Applicant,
F. BOSSHARDT,
Chartered Patent Agent,
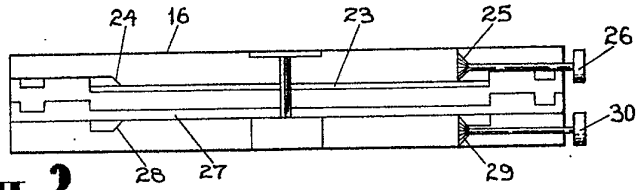31, Regent House, Cannon Street,
Manchester, 4.

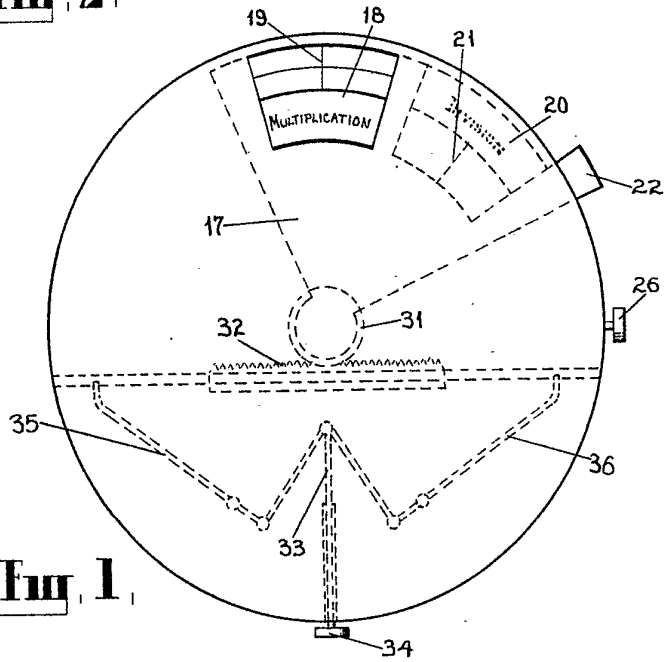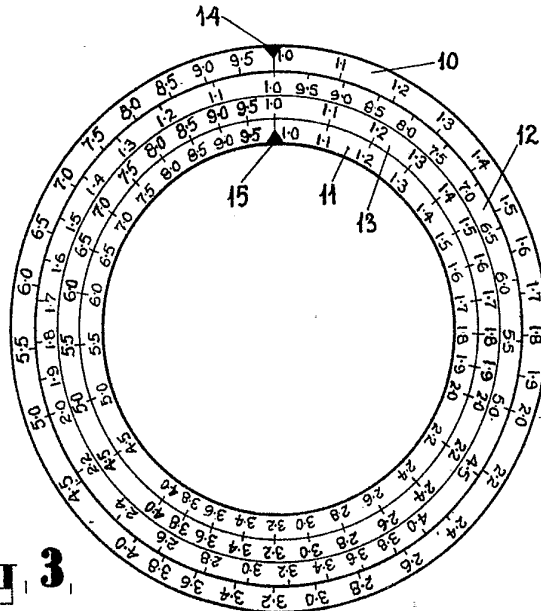751,420 COMPLETE SPECIFICATION

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

Fig. 2

Fig. 1

Fig. 3