Jan. 2, 1940. O. NELSON 2,185,677

CALCULATOR

Filed July 1, 1938 2 Sheets-Sheet 1

Fig. 1.

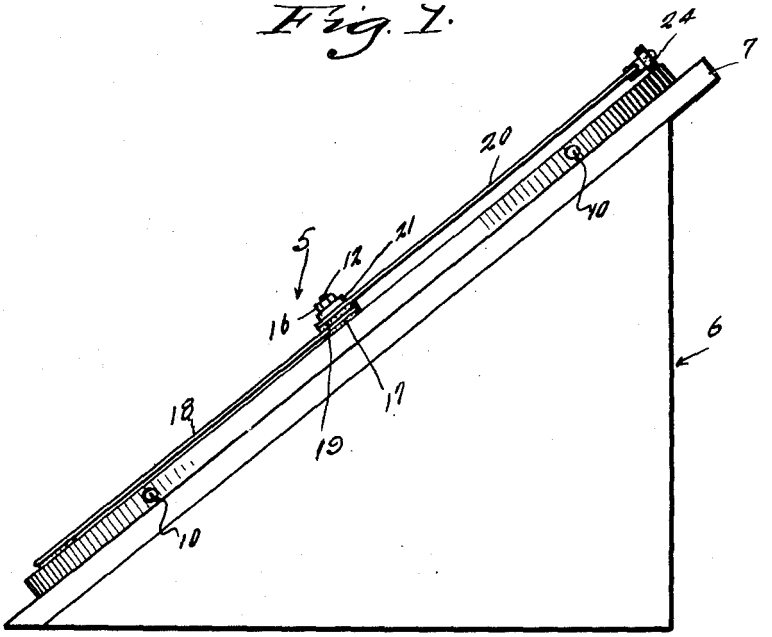


Fig. 2.

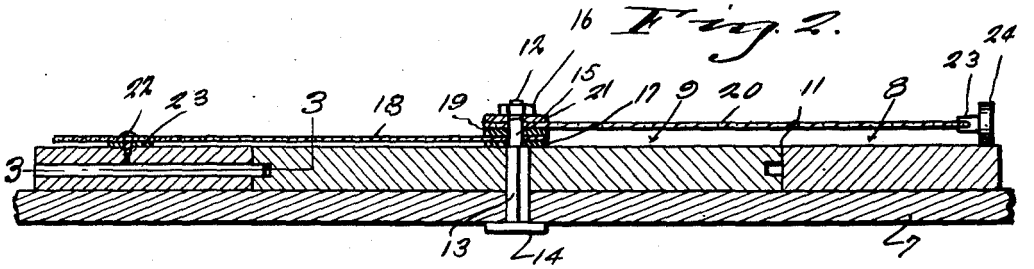
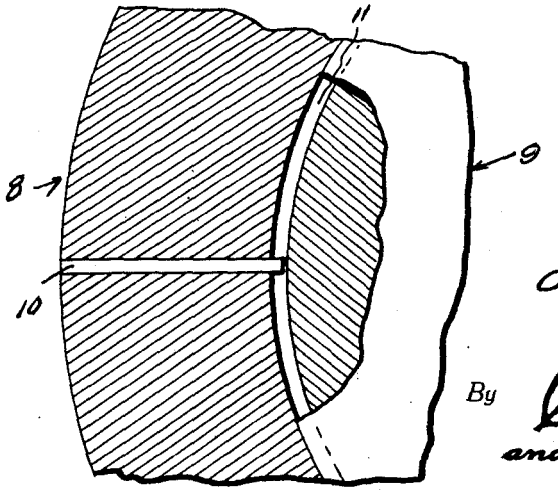


Fig. 3.



Inventor

Oscar Nelson

By Clarence A. O'Brien and Hyman Berman

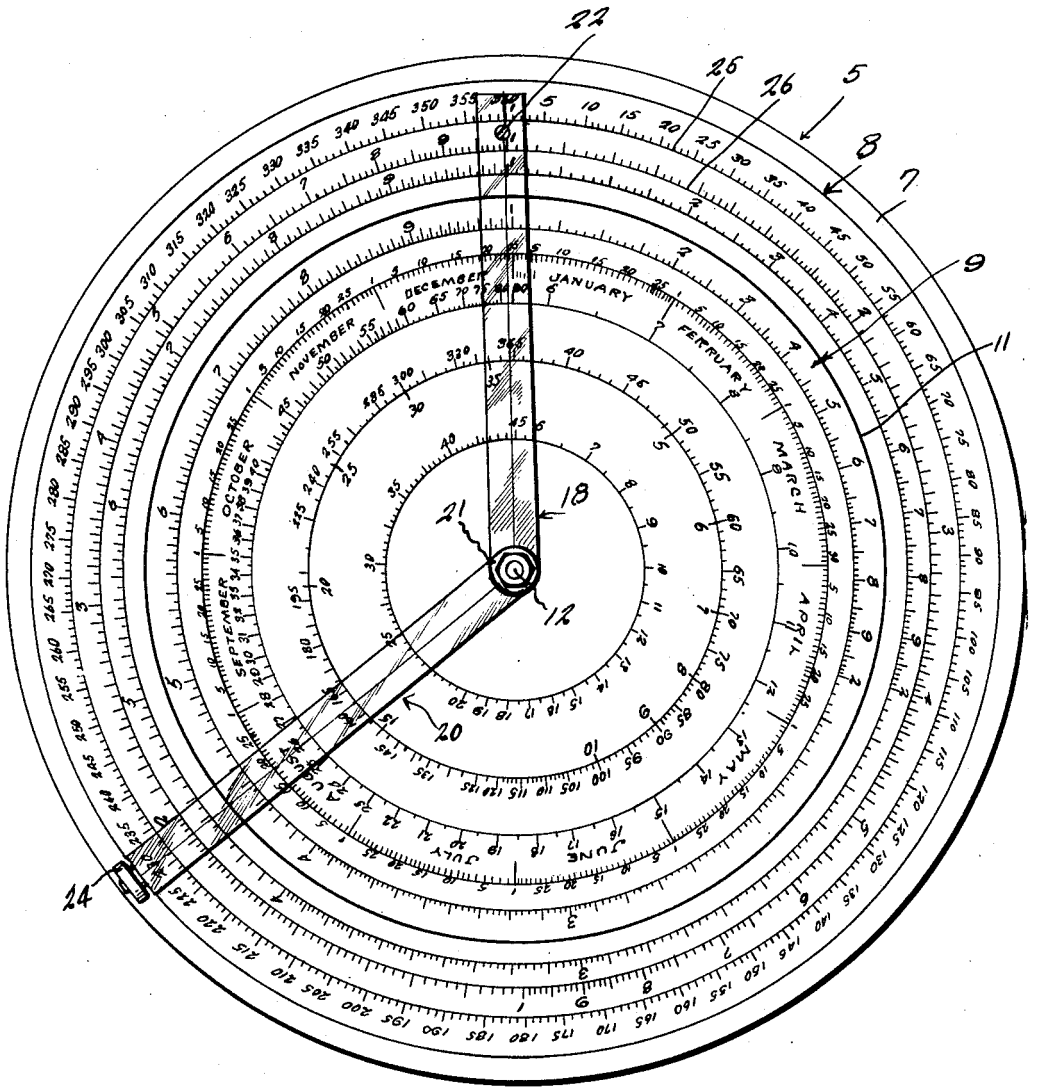
Attorneys

Jan. 2, 1940. O. NELSON 2,185,677

CALCULATOR

Filed July 1, 1938 2 Sheets-Sheet 2

Fig. 4.



Inventor

Oscar Nelson

By Clarence O'Brien and Hyman Berman

Attorneys

Patented Jan. 2, 1940 2,185,677

UNITED STATES PATENT OFFICE

2,185,677

CALCULATOR

Oscar Nelson, Walker, Minn.

Application July 1, 1938, Serial No. 217,028

1 Claim. (Cl. 235—84)

My invention relates generally to calculators operating on a logarithmic slide rule principle, and particularly to a calculator of this type which involves concentrically arranged scales and relatively movable circular elements in conjunction with radial pointers, and an important object of my invention is to provide a simple and efficient calculator useful for quickly ascertaining the answers to a variety of mathematical problems.

Another important object of my invention is to provide a calculator of the character indicated above which involves a minimum of sturdy parts, and is capable of being constructed at a low cost.

Other important objects and advantages of the invention will be apparent from a reading of the following description taken in connection with the drawings, wherein for purposes of illustration I have shown a preferred embodiment of my invention.

In the drawings:

Figure 1 is a side elevational view of a preferred embodiment.

Figure 2 is an enlarged transverse vertical sectional view taken through the table portion of the embodiment.

Figure 3 is an enlarged sectional view taken through Figure 2 approximately on the line 3—3.

Figure 4 is a plan view of the table portion showing the various scales and the inter-relation thereof.

Referring in detail to the drawings, the numeral 5 generally designates the embodiment which consists of some suitable form of support which is generally designated 6 and which in the present instance comprises a standard for resting on a surface provided with an upper portion cut at an acute angle and topped by the table 7 on which is secured by suitable means the outer rotatable scale bearing annulus 8 and the inner stationary scale bearing disk 9, the disk 9 being of a size to fit rotatably in the opening of the annulus. Radial pins 10 fixed at circumferentially spaced points on the annulus 8 and projecting from the radially inward edge of the annulus engage in the circumferential groove 11 formed in the edge of the disk 9.

Penetrating square holes in the table 7, and the disk 9 at the center thereof is the bolt 12 which is provided with an enlarged squared shank 13 and a head 14 engaging the bottom of the table 7, the said shank extending through the disk 9 and at the top of the disk having a reduced rounded shank 15 which has a short threaded portion receiving the clamping nut 16.

Circumposed on the rounded shank 15 next to the disk 9 is the spacer 17 and next above the transparent pointer or indicator 18 and above this the spacer 19 and above the spacer 19 the transparent pointer or indicator 20, and above this the retainer washer 21 which is directly engaged by the nut 16.

The transparent indicator 18 has its radially outward end traversed by a screw 22 which passes through a spacer 23 and into the annulus 8 at a point radially inwardly spaced from the peripheral edge of the annulus, thereby securing the indicator 18 for movement with the annulus 8. The transparent indicator 20 has its radially outward end set into and attached to a support 23 for the roller 24 which rolls on the top of the annulus 8 adjacent the peripheral edge thereof and in a path located beyond the radially outward end of the indicator 18 as clearly shown in Figures 1 and 2, whereby the indicator 20 may be swung around the pivot bolt 12 as required for the calculations.

Referring now to Figure 4 of the drawings it will be seen that the surface of the annulus 8 and the disk 9 are laid out with circular scales with which the indicators 18 and 20 cooperate. The outermost scale A on the annulus 8 is a protractor and day scale, and reading radially inwardly, the next scale B is a square root scale and corresponds with scale C so that the square root of any number can be read from scale C.

The scale A is simply a circle marked into 360 equal divisions to work with scale E on the stationary disk 9 which is so related thereto that January 2nd will correspond with 1 on scale A. There is a slight overlapping at the end of the year which can be put into the lower side of the January column.

The scale D, being the outermost scale on the stationary disk 9, is identical with scale C, both being used in multiplication and division.

The next inner scale is scale E already mentioned and immediately within this is the scale F which is a sine value scale which is related to scale D when the indicator is placed over any angle on the scale F.

The next inner scale is G which is divided into 365 days of the year and is arranged for use with scale C to show the fraction of the year for any given number of days in a year of 365 days.

The next inner scale is H which is a tangent scale and is related to the scale D so that the tangent values can be read on scale D for any angle on scale H.

Operation of the calculator

To multiply the stationary indicator 18 is set, by rotating the annulus 8, on a numeral on the scale D. The product will then be found on scale D opposite the multiplier on scale C.

To divide the multiplication operation is simply reversed, the quotient being found under the stationary indicator 18.

The number of days subtended by two given dates can be ascertained by using the revolving indicator 20 and reading the answer on scale A.

To find the date from which a given number of days has been subtracted, the operation described immediately above is simply reversed.

To ascertain sine values of angles the scale F is used with the scale D.

By using scale H with scale D tangent values can be ascertained.

By using scale G with scale D any fraction of a year can be ascertained, for use in calculating interest on money.

By using different combinations of the described scales computations in various types of problems can be accomplished. The dual indicator arrangement of the present invention is especially helpful in that it enables the operator of the calculator to read answers readily, quickly, and accurately.

Although I have shown and described herein a preferred embodiment of my invention, it is to be definitely understood that I do not desire to limit the application of my invention thereto, and any change or changes can be made in the structure and arrangement of the parts within the spirit of the invention and the scope of the subjoined claim.

Having described the invention, what is claimed as new is:

A calculator of the character described, said calculator comprising a base, a stationary circular disk resting on said base, an annular plate rotatably resting on said base around said disk, means retaining said annular plate on said base, an element passing non-rotatably through the centers of said base and said disk to a point above said disk, said element having an enlarged head engaging the bottom of said base, the part of said element above said disk being rounded, a pair of indicators extending across said disk and said annular plate, said indicators having their radially inward ends pivoted on said rounded part of said element, means vertically spacing said indicators on said part, and retaining means connected to the end of said element opposite said enlarged head and cooperating with said head in assembling said base, said circular disk and said indicators together.

OSCAR NELSON.