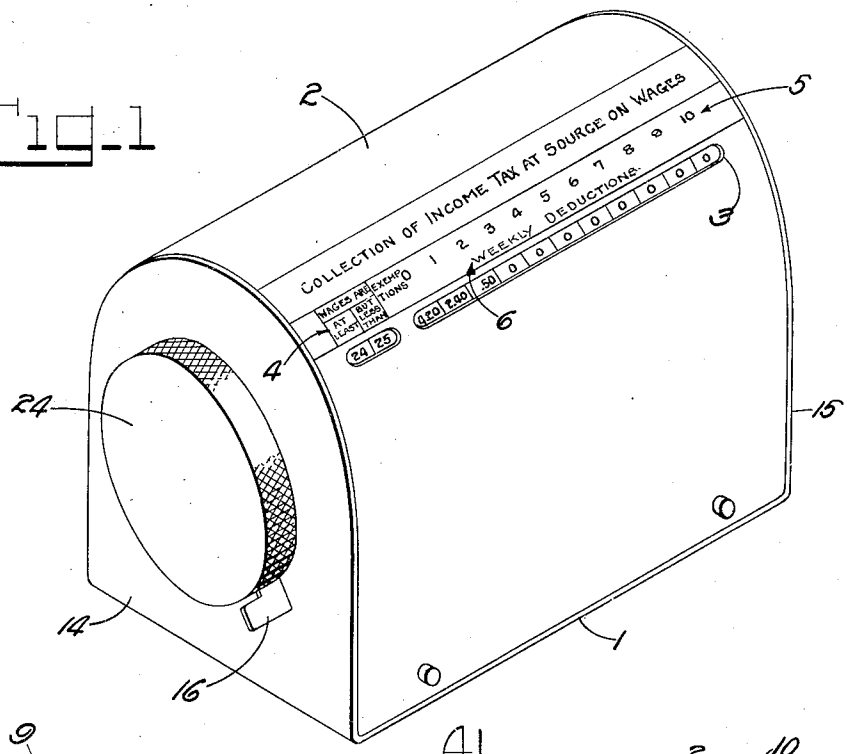
Nov. 15, 1949 C. N. CURTIS 2,488,271

COMPUTING MACHINE

Filed Oct. 3, 1947 2 Sheets-Sheet 1

Fig. 1



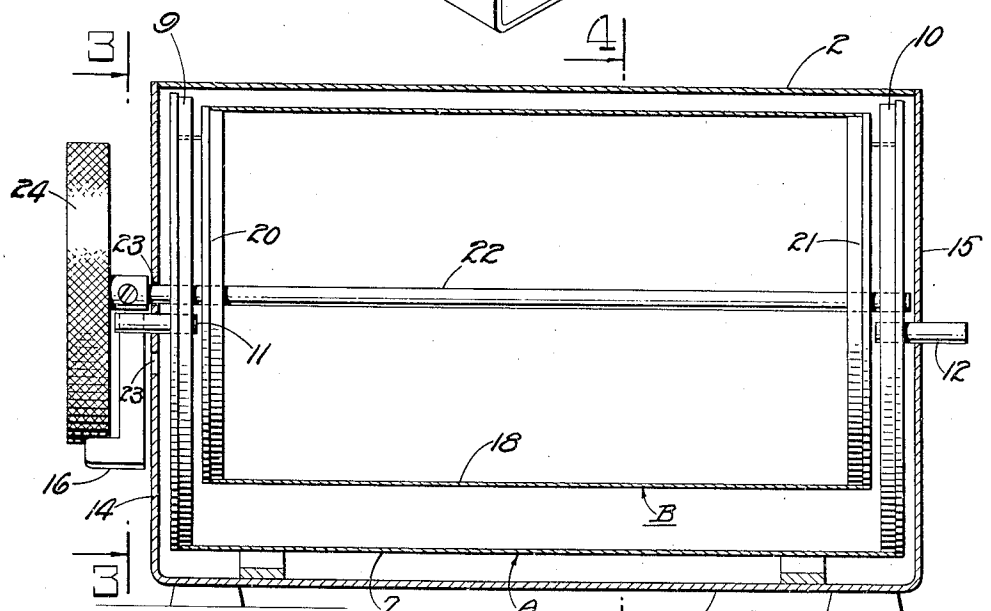


Fig. 2

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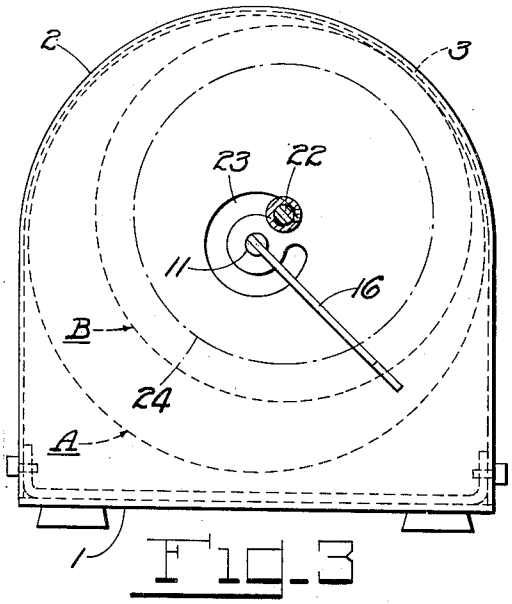


Fig. 3

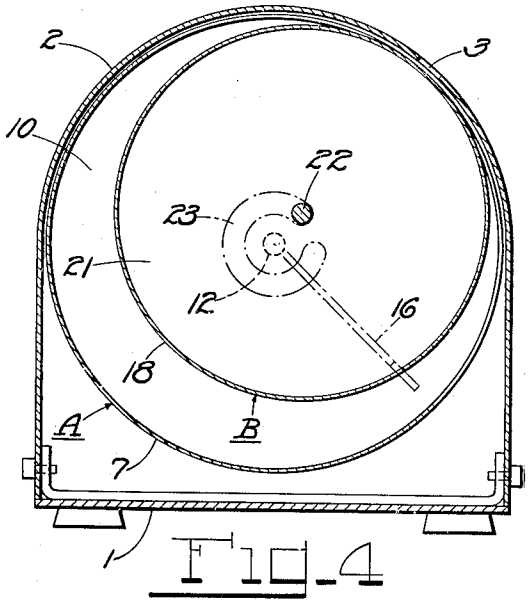


Fig. 4

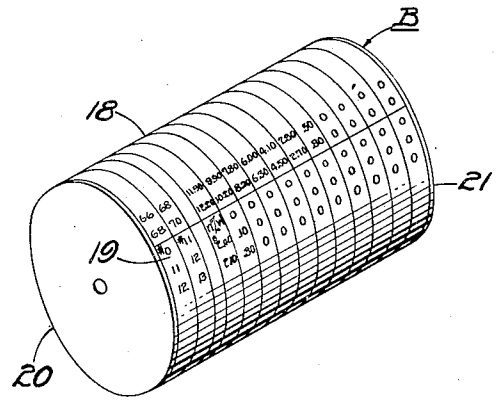


Fig. 6

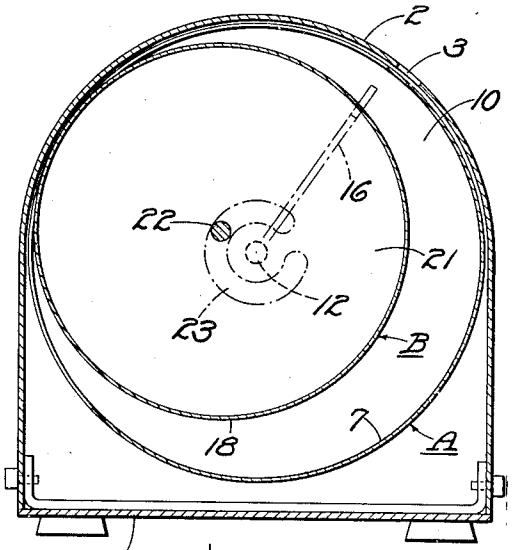


Fig. 5

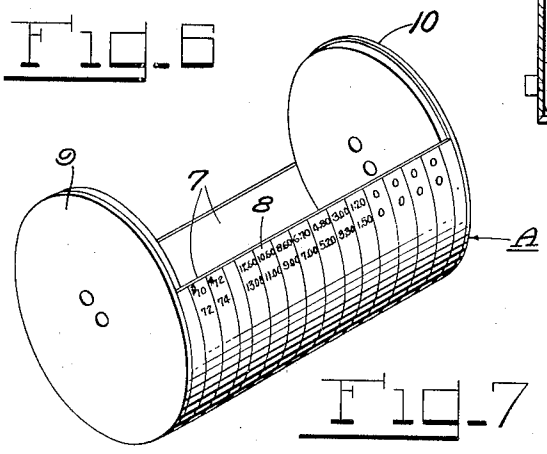


Fig. 7

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UNITED STATES PATENT OFFICE

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COMPUTING MACHINE

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Application October 3, 1947, Serial No. 777,706

6 Claims. (Cl. 235—87)

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This invention relates to computing machines, and more particularly to a machine for computing the withholding taxes on wages.

Computing machines commonly have a casing with one or more windows or apertures for sighting figures or tables placed on ratory drums or cylinders. Sometimes there are several drums arranged in a series, and sometimes there are a number of concentric cylinders. The first type requires relatively complicated mechanism, and the second type is difficult to read because of the relative remoteness of the figures on the interior cylinders from the reading apertures. Such devices require careful adjustment, and are usually expensive.

It is an object of the present invention to provide a computer in which the mechanism is simple and inexpensive, and yet easier to operate and read. This is accomplished by providing an interior cylinder which is rotatable on a variable axis adapted to be swung about the fixed axis of the outer cylinder. The nature of the invention will best be understood from the following description in conjunction with the accompanying drawings, in which:

Fig. 1 is a perspective view of a device embodying the invention;

Fig. 2 is a vertical longitudinal section;

Fig. 3 is a section taken substantially on the line 3—3 of Fig. 2;

Fig. 4 is a section taken on the line 4—4 of Fig. 2 and showing one operative relation of the parts;

Fig. 5 is a similar view showing a different operative relation;

Fig. 6 is a detail view of the inner cylinder; and

Fig. 7 is a detail view of the outer cylinder.

In the drawings, the computer has a base 1 to which a hood or cover 2 is held by any suitable means. An aperture or window 3 is formed conveniently in the hood. Suitable headings or titles indicated at 4, 5 and 6, are located adjacent the window. The nature of these headings is determined by the intended use of the computer; in the present instance, they are for computing a withholding tax according to the wages paid. The heading at 4 shows which columns indicate wages; the headings 5 indicate the exemptions; and the heading 6 shows that the columns of figures beneath it are for weekly deductions. Inside the hood is placed an arcuate and preferably semi-cylindrical sheet 7 which bears a table of values 8 (Fig. 7). Opposite edges of the sheet are secured to discs 9 and 10 which

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are mounted on shafts 11 and 12. For convenience, the elements 7, 9 and 10 will be referred to as segmental drum or cylinder A (Fig. 7). The shafts 11 and 12 are journalled in end walls 14 and 15 of the device, and shaft 11 is provided with a handle 16. A second drum B, which is preferably a complete cylinder, comprises a peripheral arcuate sheet 18 bearing tables 19 and end discs 20 and 21 to which the sheet 18 is secured. This drum is carried on a shaft 22 journalled in the discs 9 and 10 (see particularly Fig. 2). Shaft 22 also extends through an arcuate slot 23 in end wall 14, and secured to the end thereof is a knob 24. The arcuate slot 23 permits the shaft 22 to be swung in an arc around shaft 11. While an arcuate slot is preferred, it is essential that the end wall have an opening capable of permitting the shaft 22 to swing in an arc about the shaft 11. The radius of the arc is determined by the distance between the two shafts, and this in turn is determined by the relative sizes of the two drums and the hood. Normally the segmental drum A will be approximately semi-cylindrical, though it may cover more than 180° of the periphery of the discs. The space between the ends of the sheet 7 might be small enough to be considered merely an aperture in a cylinder, if for some reason peculiar to the use of the device the inner drum was very small. The opening so formed in the outer cylinder will at all events be large enough to permit the periphery of the inner drum B to be swung far enough so that the tables 19 may be brought to a reading position as near the reading aperture as the tables 8 are brought when in reading position. Thus the two drums are alternately brought into a reading position in which their surfaces are equally distant from the window.

The tables 8 are a continuation of the values of table 19, i. e. the values of table 8 begin where the values of table 19 end.

In operation, with the handle 16 in the position shown in Figs. 3 and 4, the operator turns the knob 24 in order to turn the inner cylinder B until a desired wage setting is reached. For example, if the employee whose withholding tax is sought earns $24.50, the knob is turned until "24" appears below the sub-heading "at least" and "25" appears below the sub-heading "but less than" under the title "wages are" indicated at 4. With this setting, the employee's tax is $4.20 if he comes within the column marked "0" of the exemption code indicated at 5, or $2.40 if his exemption heading is 1. So long as the

employee earns less than $70.00, the computation is made by turning the knob 24 and the cylinder B. If the wages are over $70.00, then the operator grasps the handle 16 and turns the segmental drum A. As handle 16 is turned from the position of Fig. 4 toward the position shown in Fig. 5, the tables 8 of the moving segmental drum A approach reading position and the inner drum B is simultaneously swung away from reading position. By the time the tables 8 have reached computing position, the inner drum B has been moved back out of the way (Fig. 5) and any given point on the sheet 7 which is brought opposite the aperture 3 occupies the same position with respect to said aperture which every point on the sheet 18 formerly occupied. Thus both tables are equally easy to read, as both tables, when in reading position, are equally near to the window 3.

The ends of the arcuate slot 23 serve as stops for the shaft 11 which passes through it, and this permits the segmental drum A to be rotated through an arc of about 270° more or less, and at least 180° of this movement causes values on the tables 8 to pass the window. In the position shown in Fig. 4, the mid-point of the tables 8 is almost diametrically opposite the window, and the center of gravity of the combined drums is then to the right of the axis of the outer drum. This causes the segmental drum and, consequently, the axis of the inner drum, to remain stationary. If a tax is sought for a wage of $70.00 or less, the operator turns the knob and inner drum to the desired location. If a tax is sought for a wage over $70.00, the operator lifts the handle 16 and rotates the segmental drum about its axis. As this rotation proceeds, the axis of the inner drum is shifted away from the window, and the tables 8 assume the same position and degree of proximity to the window formerly possessed by the tables 19. Since the axis of the inner drum is shifted automatically whenever the outer cylinder or segmental drum is used, no special effort or attention is required of the operator. Computations may be made more rapidly than with known devices, as there is so little effort involved and the figures on the tables are so quickly and easily seen.

I claim:

1. A computing machine having, in combination, a frame, a segmental drum mounted for rotation in said frame, means for rotating said segmental drum, a second drum having a cylindrical peripheral surface surrounding the axis of rotation of said segmental drum mounted for rotation in the segmental drum, means for rotating the second drum, and means for laterally moving the axis of rotation of said second drum with respect to the axis of rotation of the segmental drum to cause said peripheral surface to come into close approximation with the inner surface of said segmental drum in a desired location.

2. A computing machine having, in combination, a frame, a segmental drum mounted for rotation in the frame, a second drum mounted for rotation in the first drum, means for rotating the second drum, and means for rotating the segmental drum and for swinging the axis of said second drum about the axis of said segmental drum.

3. A computing machine having, in combination, a frame, a segmental drum mounted for rotation in said frame, a second drum mounted for rotation in said frame, means for rotating said drum, and means for swinging the axis of rotation of the second drum radially about the axis of the first drum.

4. A computing machine having, in combination, a casing, an aperture in the casing, a cylinder mounted for rotary movement within the casing, means for rotating the cylinder, an aperture in the peripheral surface of the cylinder, a second cylinder rotatably mounted within the first cylinder, means for rotating the second cylinder, and means for swinging the axis of rotation of the second cylinder to bring its peripheral portions into close approximation with the aperture in said casing in the region of the aperture in the first named cylinder.

5. A computing machine having, in combination, a frame, a cover, a window in the cover, a drum mounted for rotation in the frame having a peripheral surface held adjacent the window during a portion of the rotative movement of the drum and removed therefrom during the portion of said rotative movement, a second drum rotatably mounted in the first named drum having a peripheral surface which is held spaced from the window when the peripheral surface of the first drum is adjacent the window and held substantially equally adjacent said window when the peripheral surface of the first drum is removed therefrom, and means for rotating said drums.

6. A computing machine having, in combination, a frame, a cover for said frame, an arcuate supporting surface radially swingable about fixed axes in said frame, a computing table on said supporting surface, a cylindrical supporting surface mounted in said frame for rotation about a variable axis, a computing table on said cylindrical supporting surface, an aperture in said cover for viewing said computing tables, means for rotating said cylindrical surface, means for radially swinging said arcuate surface about its fixed axis, and means for swinging the axis of rotation of the cylindrical surface about the fixed axis of the arcuate supporting surface, said last named means serving to swing the arcuate surface radially during use of the computing table thereon, to swing said variable axis of rotation to a relatively remote position with respect to said aperture when said arcuate surface is employed and to swing said variable axis to a relatively nearer position with respect to said aperture when said arcuate surface is not employed.

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