No. 695,099. Patented Mar. 11, 1902.

F. L. FLEISHMAN.

CALCULATING MACHINE.

(Application filed July 24, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

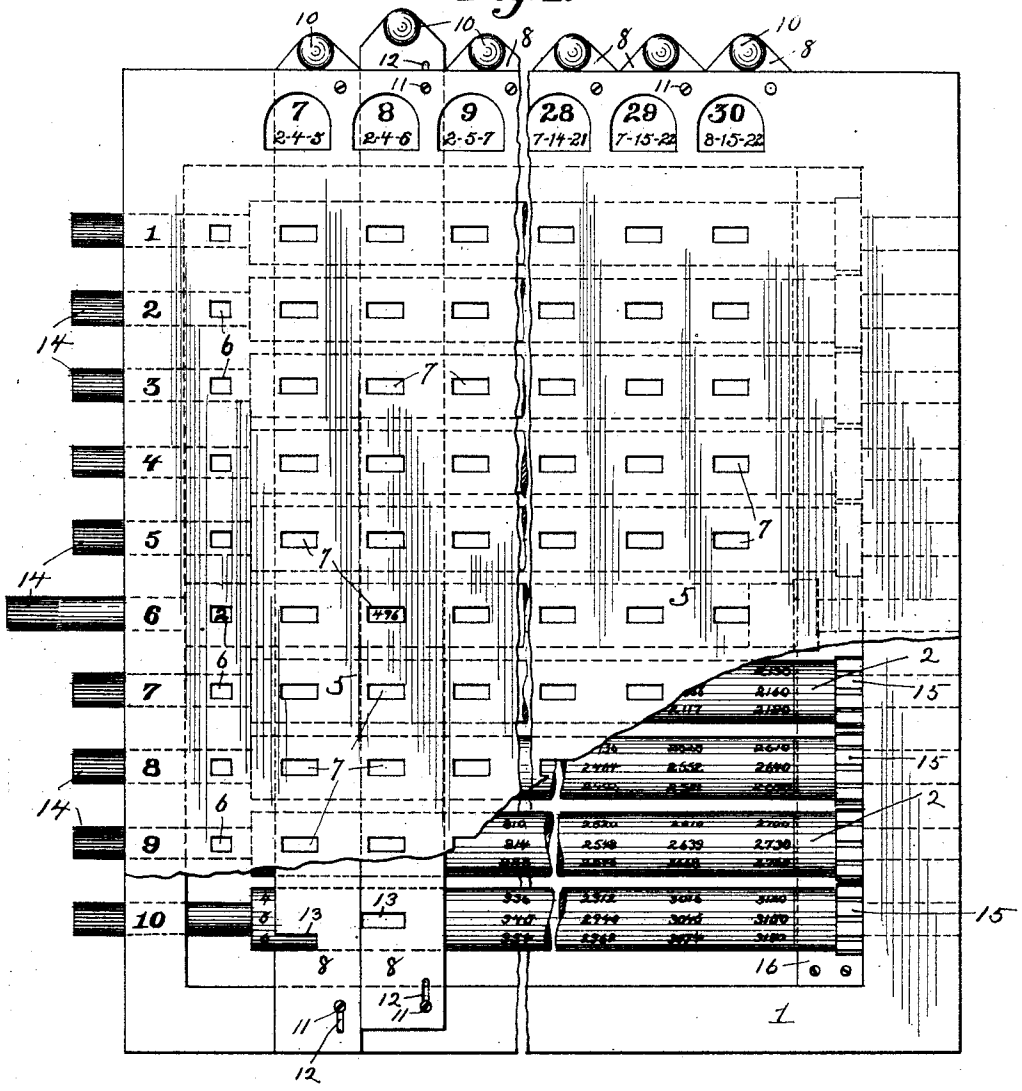
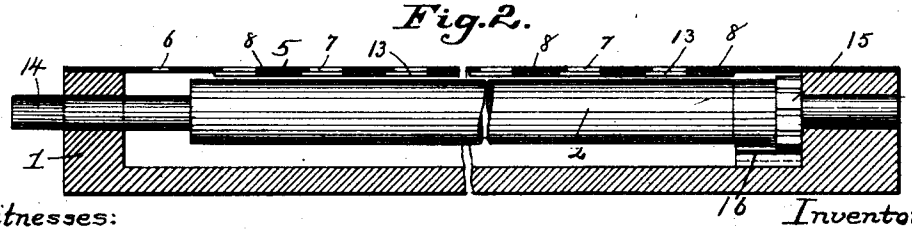


Fig. 2.



Witnesses:
Walter Famariss
Fred'k L. Sweet.

Inventor:
Frank L. Fleishman
By King & Totten
Attorneys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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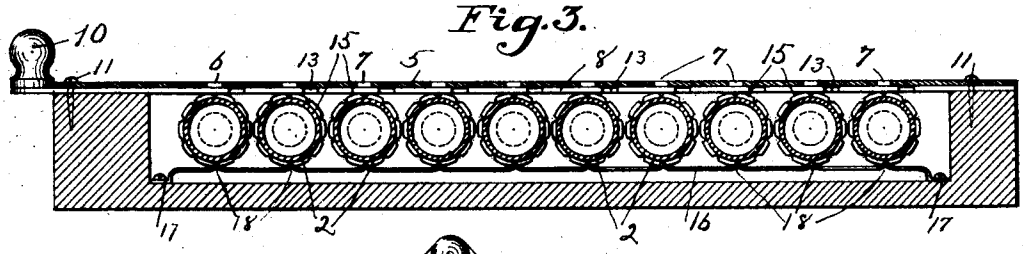
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(No Model.) 2 Sheets—Sheet 2.

Fig. 3.



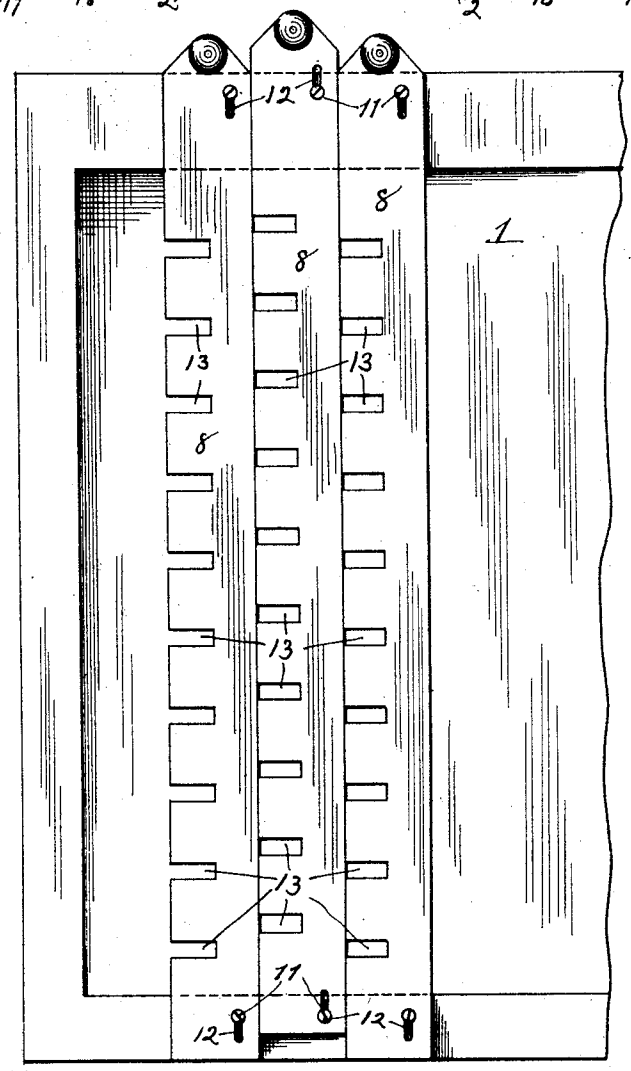


Fig. 4.

Witnesses:
Walter Famariss
Fred D Sweet

Inventor:
Frank L Fleishman
By Macy & Bates
Attorneys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FRANK L. FLEISHMAN, OF ALLEGHENY, PENNSYLVANIA.

CALCULATING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 695,099, dated March 11, 1902.

Application filed July 24, 1901. Serial No. 69,512. (No model.)

To all whom it may concern:

Be it known that I, FRANK L. FLEISHMAN, a resident of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Calculating-Machines; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to calculating devices, and more especially to such devices as are adapted for calculating the wages of workmen or for performing any other calculations in which two factors enter.

The object of my invention is to provide a device of this character which is compact, simple, and easy to operate, in which error in making the calculation is avoided, and which is simple and cheap to manufacture.

To these ends it comprises, generally stated, a rectangular frame or casing, in which are mounted a series of endwise-movable rollers, said rollers bearing on their faces the various calculations and having marked around the same, preferably at one end thereof, the units of one of the factors entering into said calculations, the tens of the same factor being marked on the frame or casing opposite the several rollers, together with a perforated face-plate covering said rollers, and a series of movable slides also covering said rollers and being designated by the other factor which enters into the various calculations.

In the accompanying drawings, Figure 1 is a face view, partly broken away, of my improved calculating device. Fig. 2 is a horizontal sectional view of the same. Fig. 3 is a transverse vertical section thereof, and Fig. 4 is a detail view showing the construction and manner of mounting the endwise-movable slides.

The calculating device comprises a rectangular frame 1, in which are mounted a series of rollers 2, ten such rollers being shown; but the number will vary as is required. These rollers have marked around the same, preferably at one end, as shown on the left-hand end on Fig. 1, the numerals from zero to "9," which are the units of one of the factors entering into the calculations, the tens of the same factor being marked on the frame opposite the respective rollers, as shown on the left of Fig. 1. Covering these rollers is the face-plate 5, which is provided with a series of small openings 6, through which the units marked on the left hand of the rollers become visible, and with a number of series of larger openings 7, through which the various calculations on the rollers 2 are viewed. The number of series of openings 7 will depend upon the possible range of the other factor which is to enter into the calculations, and this will depend upon the particular work for which the calculator is designed, as will hereinafter appear. Also mounted over the rollers 2 and preferably just inside the face-plate 5 are a series of vertically-movable slides 8, which are designated, preferably, by marking on the face plate or frame at their upper ends by a series of numbers, such as indicated by "7, 8, 9 to 28, 29, 30," which represent the other factors which enter into the calculations, and the number of these slides which are provided in the device will depend upon the possible range of this factor of the calculation, which will necessarily depend upon the work for which the device is designed and will vary in different lines of business. The number of these slides 8 will determine the length of the frame 1. In the drawings I have shown but six such slides, the device being broken at the middle to indicate that any number of intermediate slides may be employed. These slides are provided with any suitable means, such as the knobs 10, for moving them endwise, and this endwise movement is limited by any suitable means, such as the pins 11, which engage the slots 12, cut in said slides. Suitable openings 13 are formed in the slides, which when the slides are elevated will register with the openings 7 in the face-plate 5. For convenience and cheapness in making I prefer to form these openings 13 by slotting the plates from one side rather than by perforating the same.

The rollers 2 are mounted so as to rotate and also so as to be movable endwise, as is indicated by the roller opposite the number "6" on the frame. One of the journals of the rollers is provided with a knurled end 14, whereby said rollers may be rotated and also moved endwise. Suitable means are also provided for preventing the said rollers from rotating idly and for stopping them so that the units number will be in proper position to be viewed

through the openings 6 and the calculations in proper position to be viewed through the openings 7. A convenient means for accomplishing this result is shown in the drawings and comprises a small notched wheel 15, formed on or secured to each roller and which is adapted to be engaged by any yielding means, such as a suitable spring. For convenience in making I prefer to employ a single spring 16 for all of the rollers, as shown in Fig. 3, said spring comprising a flat spring-strip having its ends secured at 17 to the casing and being provided opposite each one of the rollers with an angle or projection 18 for engaging the notches in the roller. If preferred, however, a separate spring for each roller may be employed, and the notches 15 may be formed directly in the face of the rollers instead of in a wheel secured thereto. The spring-plate 16 is shown of such width that it will still engage the notches in the rollers when the same are moved endwise, for reasons which will be readily apparent.

The operation of my device is as follows: The roller 2 which corresponds to the tens number on the frame of one of the factors of the desired calculation is seized by its knurled spindle 14 and moved endwise and then rotated until the desired units number of that factor shows through the proper opening 6 in the face-plate 5. The spring 16 will click into the notches 15 in the roller at each step of the rotation, and when the proper units number has been reached the said spring will hold the roller in that position. The operator then grasps the knob 10 on the slide 8 which is designated by the other factor entering into the desired calculation and draws the same upward, thereby bringing the slots 13 thereof into alinement with the series of openings 7 in the face-plate 5 which correspond to said slide. This will expose one of the calculations on the roller which has been moved to the left, which calculation is the desired one. For example, supposing it is desired to find the amount due for sixty-two hours' labor at eight cents per hour, the roller 2 which corresponds to the numeral "6" on the left of the frame will be moved endwise and then rotated until the units figure "2" on the left hand of said roller appears through the opening 6 in the face-plate. This determines the factor "62." The slide marked 8 is then raised, thereby exposing the calculation "496," which gives four dollars and ninety-six cents as the sum due for sixty-two hours' work at eight cents per hour.

It will be observed that the various series of openings 7 in the face-plate do not aline with the calculations on the rollers until the latter are moved to the left, so that only the calculations of the particular roller which is moved to the left could possibly appear through the openings 7 in the face-plate. Furthermore, the openings in the slides 8 do not register with the openings 7 in the face-plate until the slides are elevated, so that the calculations on the roller which has been moved endwise are not made visible until the proper slide has been elevated, and this naturally exposes only one of said calculations. As a consequence, if the operator raises but a single slide it is never possible to expose more than a single calculation, and any confusion and liability to error that might arise from the exposure of more than a single calculation are therefore avoided and accuracy assured. It will of course be understood that the various calculations on the rollers are in line horizontally with the units numbers on the end of said rollers and that they are also in line vertically with the space between the series of openings 7 in the face-plate and do not come underneath these openings until the rollers are moved to the left.

It will be observed that opposite the upper end of each slide 8, in addition to the factor-number there indicated, are three other numbers, and these will vary according to the different uses to which the calculator is designed, but, as shown, represent the amounts due for a quarter-hour, half-hour, and three-quarters of an hour, respectively, at the particular rate per hour designated for each slide, so that if a fraction of an hour is to be compensated for the proper one of these fractional numbers will be added to the calculation which appears through the face-plate of the device.

While I have shown and described the rollers 2 as being cylindrical, it will be readily understood that they may be polygonal, if desired. It is also obvious that the units numbers need not necessarily be marked at the end of the rollers, but may be marked thereon at any point intermediate the ends. In that case the series of openings 6 in the face-plate will be located in such position that the units number will appear therethrough when the rollers are moved endwise, and the tens of the same factor of the calculation will be conveniently marked on the face-plate adjacent to these openings 6. I furthermore wish it understood that the details of construction may be varied without departing from the spirit of my invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A calculating device comprising a frame or casing, a series of endwise-movable rollers journaled therein, said rollers bearing on their faces the calculations and having marked around the same the units of one factor entering into the calculations, the tens of the same factor being marked on the frame or casing opposite the respective rollers, a perforated face-plate covering said rollers, and a series of movable slides having openings therein also mounted over said rollers, said slides being designated by the other factor of the calculations.

2. A calculating device comprising a frame or casing, a series of endwise-movable rollers

journaled in said frame, said rollers bearing on their faces the calculations and having marked thereon around the same the units of one factor entering into the calculations, the tens of the same factor being marked on the frame or casing opposite the respective rollers, a perforated plate covering said rollers, a series of movable slides having slots cut in on one edge thereof also mounted over said rollers, said slides being designated by the other factor entering into the calculations, and means for limiting the movements of said slides.

3. A calculating device comprising a frame or casing, a series of endwise-movable rollers journaled in said frame, said rollers bearing on their faces the calculations and having marked around the same the units of one of the factors entering into the calculations, the tens of the same factor being marked on the frame or casing opposite the respective rollers, said rollers being provided with a series of notches, a yielding detent for engaging said notches, a perforated face-plate covering said rollers, and a series of slotted slides also mounted over said rollers and being designated by the other factor entering into the calculations.

In testimony whereof I, the said FRANK L. FLEISHMAN, have hereunto set my hand.

FRANK L. FLEISHMAN.

Witnesses:

F. W. WINTER,

ROBERT C. TOTTEN.