No. 819,689. PATENTED MAY 1, 1906.

W. T. BREWER.

INSTRUMENT FOR COMPUTING FRACTIONS.

APPLICATION FILED JUNE 2, 1905.

2 SHEETS—SHEET 1.

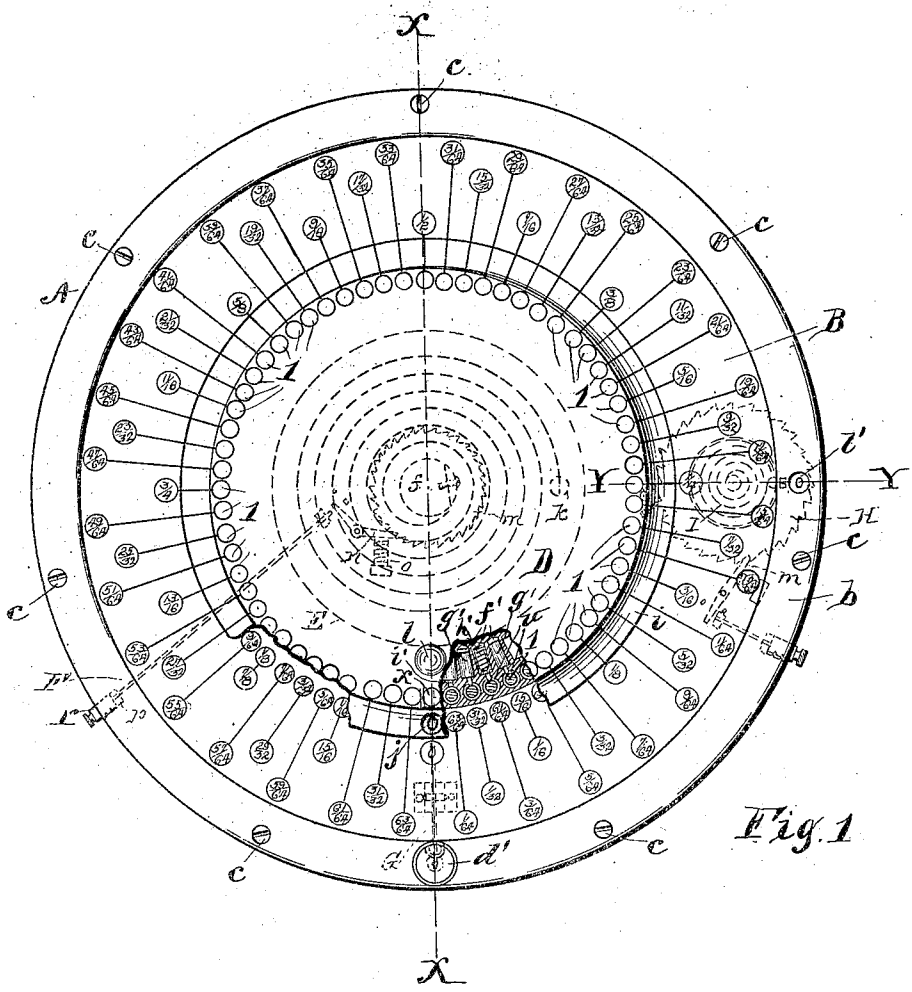

Fig. 1

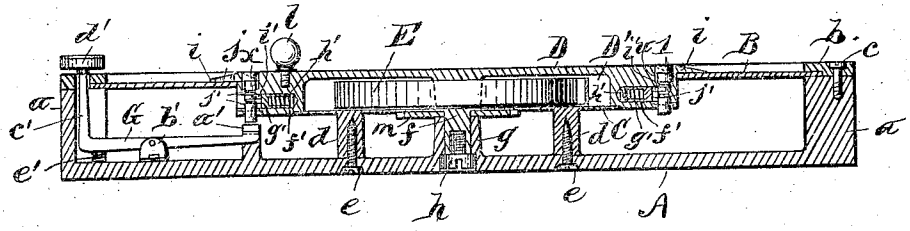

Fig. 2

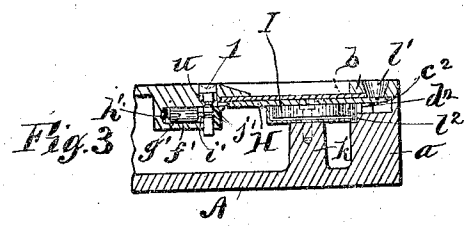

Fig. 3

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Fig. 4

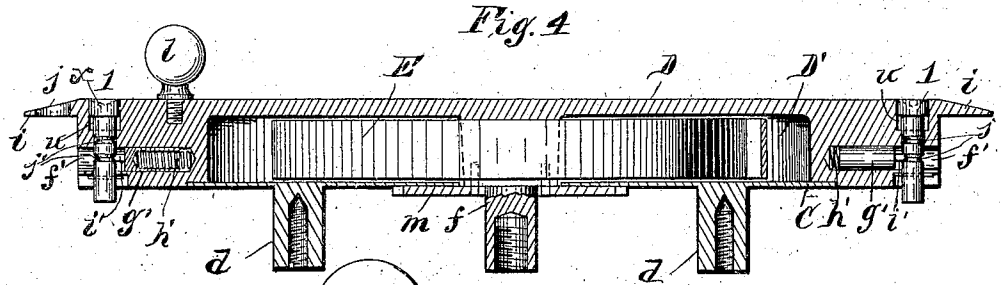


Fig. 5

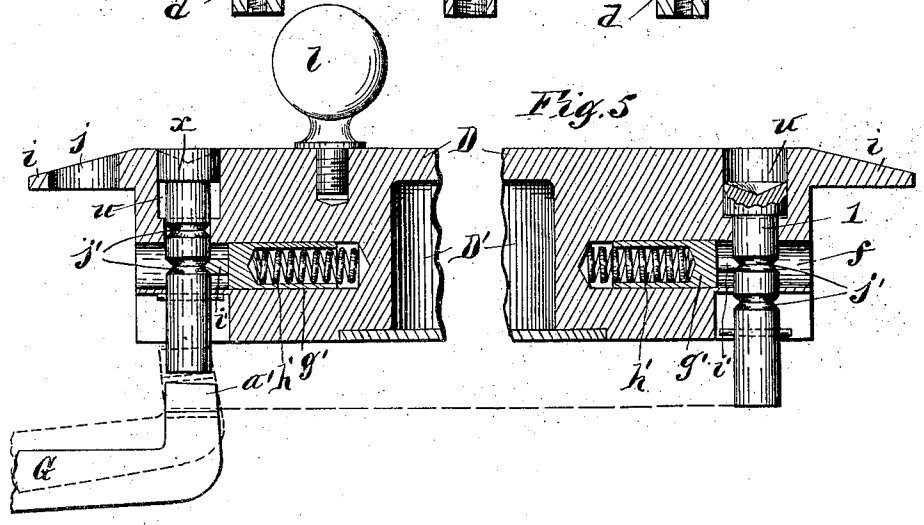


Fig. 6

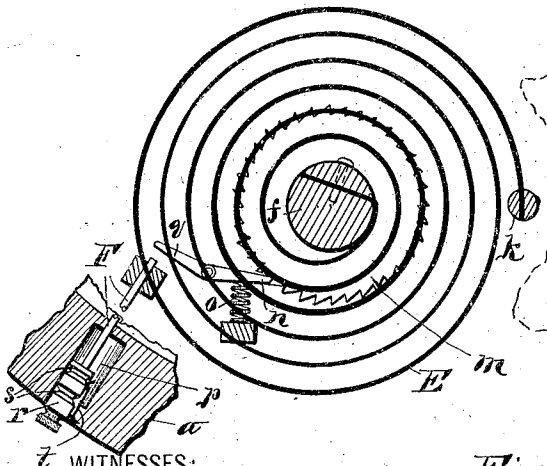


Fig. 7

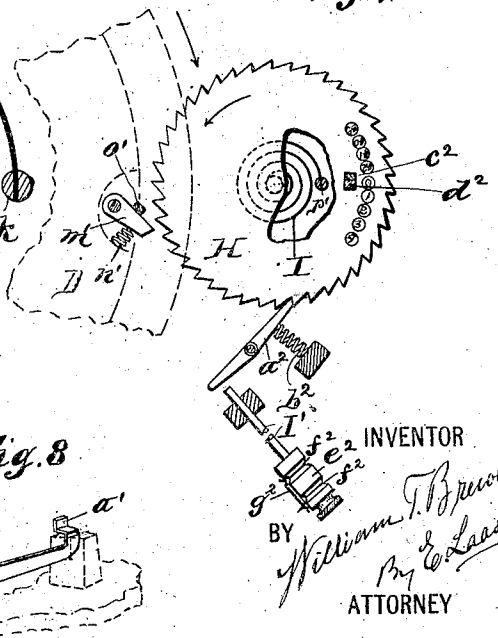
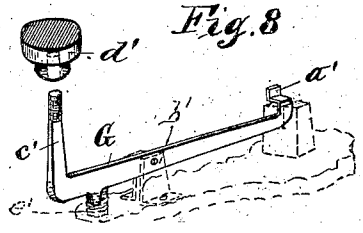


Fig. 8



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UNITED STATES PATENT OFFICE.

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INSTRUMENT FOR COMPUTING FRACTIONS.

No. 819,689. Specification of Letters Patent. Patented May 1, 1906.

Application filed June 2, 1905. Serial No. 263,503.

To all whom it may concern:

Be it known that I, WILLIAM T. BREWER, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Instruments for Computing Fractions, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to adding devices, and it is designed for computing fractions.

The main object of the present invention is to produce an instrument which shall be simple and shall be accurate for the purpose stated and at the same time can be easily and conveniently operated.

To that end the invention consists in the novel construction and combination of the component parts of the computing instrument, as hereinafter fully described, and set forth in the claims.

In the accompanying drawings, Figure 1 is a plan view of the instrument embodying my invention. Figs. 2 and 3 are transverse sections taken on the dotted lines X X and Y Y, respectively, in Fig. 1. Fig. 4 is an enlarged transverse section of the revoluble spring-actuated disk. Fig. 5 is a further enlarged transverse section of the disk and showing more clearly the means for controlling the movement thereof. Fig. 6 is an enlarged detail view of the spiral spring which rotates the disk and showing the ratchet-wheel and manually-controlled pawl employed for locking the disk against rotation during the winding of the spring. Fig. 7 is an enlarged detail plan view of the ratchet-wheel provided with whole numbers and showing the means for actuating the same and the manually-controlled retaining-pawl, and Fig. 8 is a detail perspective view of the key-lever and the detent which engages the indicating pins or stops.

Similar letters of reference indicate corresponding parts.

A represents a base which is preferably composed of metal of any suitable kind and is formed annular and provided at its edges with a wall *a*, thereby producing a case.

B represents a metallic plate which is the form of an annulus and is secured stationary at its outer edge to the top of the wall *a*, preferably by means of ring *b*, held detachably in position by screws *c c*, as clearly shown in Fig. 2 of the drawings. This annulus B is provided with a graduated scale of fractions to be computed and preferably arranged in annular series or sets. The fractions of the outer series are divided into sixty-fourths, the next series into thirty-seconds, and the next series into sixteenths. The innermost series of said scale consists of "0," "$\frac{1}{8}$," "$\frac{1}{4}$," "$\frac{1}{2}$," "$\frac{5}{8}$," "$\frac{3}{4}$," and "$\frac{7}{8}$." This annulus B is also provided with a single annular series of corresponding computing-fractions disposed concentric to the scale-fractions. These computing-fractions are graduated in a reverse direction from the scale-fractions and include "0" corresponding with "0" of the scale, as clearly shown in Fig. 1 of the drawings.

C denotes a central annular metallic plate which is disposed below the plane of the annulus B and formed with studs *d d* on its under side, bearing upon the base A. The plate is held rigidly by means of screws *e e*, passing through the base and entering said studs, as shown in Fig. 2 of the drawings.

D denotes a revoluble disk preferably composed of metal. Said disk is formed with a cavity D′ in its under side and provided in the center of the cavity with a stud *f*, which is journaled in a socket *g*, formed on the base A, and through said base passes a screw *h*, which engages the stud *f* to sustain the disk in its position. The said disk is formed with a horizontal peripheral flange *i*, projecting over the annulus B, so as to conceal the computing series of fractions. This flange is provided with an inspection-aperture *j*, disposed to normally expose "0" of said series and consecutively expose the fractions thereof accordingly with the fractions of the scale which are being added, as will be hereinafter more fully explained. Said disk D is automatically rotated in one direction by means of a spiral spring E, which is fastened at the inner end to the stud *f* of the disk and fastened at the outer end to a lug or pin *k*, projecting from the top of the rigid plate C. This spring is wound by turning the disk to the left, and to conveniently turn the same I provide the top of the disk with a ball or other device, (indicated by the letter *l*.) To prevent the disk from turning and the resultant unwinding of the spring until the instrument is to be used for adding, I attach a ratchet-wheel *m* to the stud *f*, which ratchet-

wheel is locked against reverse rotation by a pawl *n*, preferably pivoted to the under side of the plate C and held in engagement with the said ratchet-wheel by means of a suitably-supported coiled spring *o*. (Shown in Fig. 6 of the drawings.)

F denotes a longitudinally-movable horizontal rod which is disposed substantially radially in relation to the base and extends through a socket *p* in the wall *a* thereof and may be supported in any suitable and convenient manner. When this rod is pushed inward, the inner end thereof is adapted to engage an arm *q*, fastened rigidly to the pawl *n*, to release the ratchet-wheel to permit the disk to be rotated by the spiral spring E. This rod is provided with a suitable handle *r* for operating it and consisting, preferably, of a sleeve movable in the aforesaid socket *p*. To lock the rod in both its inner and outer positions, I provided the sleeve or handle *r* with annular circumferential grooves *s s*, which are automatically engaged by a projection formed on a spring-plate *t*, secured to the wall *a* of the base within the socket *p*, as clearly shown in Fig. 6 of the drawings. It will be understood that before actuating the said rod F to disengage the pawl from the ratchet-wheel it is necessary to employ means for locking the disk against rotation in opposition to the spiral spring, which means will be shortly described. The said disk is provided with an annular series of vertical openings *u u*, disposed adjacent to its periphery, and in said openings are supported pins *l l*, which correspond to the respective fractions of the scale, and therefore constitute indicators, as clearly shown in Fig. 1 of the drawings. These pins form stops and coöperating with a detent *a'* serve to regulate the action of the disk, as will now be described. These pins are designed to be depressed to render them operative and are normally in raised position.

G represents a manually-operated horizontal lever which is disposed radially in relation to the base and is concealed under the annulus B and pivoted to a suitable support, (indicated at *b'*.) The outer end of the lever is formed with an upward extension *c*, which protrudes through the top of the wall *a* and is provided with a button or key *d'* for depressing the lever, said lever being moved to its normal position by means of a coiled spring *e'*, disposed under the same. The inner end of this lever is bent laterally and then upwardly to form the detent *a'*, hereinbefore referred to and as more clearly shown in Fig. 8 of the drawings. This detent is disposed in the path of the said pins *l l* when the latter are depressed to limit the rotation of the disk, and by depressing the button or key of the lever the detent lifts the pins, and thus restores them to their normal positions. One of said pins (indicated at *x*) I term the "primary stop" to differentiate from the indicating-pins, inasmuch as it corresponds to "zero" and engages the detent *a'* to hold the disk in its normal or starting position in opposition to the aforesaid spring E when the pawl *n* is moved out of engagement with the ratchet-wheel *m* subsequent to the winding of the spring. When the said disk is in its normal position, the inspection-aperture *j* thereof is caused to expose "0" or zero of the computing series of fractions, as clearly shown in Fig. 1 of the drawings. In the edge of the disk are provided radially-disposed sockets *f'' f''*, communicating with the respective openings *u u*, in which the pins *l l* are arranged. In these sockets are carried bolts *g' g'*, which are pressed outwardly by means of coiled springs *h' h'*, and the outer end portions of these bolts are reduced circumferentially and tapered to form tongues, as indicated at *i' i'*, which tongues are adapted to engage annular grooves *j' j'*, formed in the pins *l l*, to automatically lock the pins in either raised or depressed positions. It will be understood that the said springs permit the pins to be readily raised by the lever G when required, which movement serves to disengage the pins from the detent when the lever is restored to its normal position by the aforesaid spring *e'*, and thereby releases the disk. By the consecutive engagements of the pins with the detent and their release therefrom the spring E is permitted to intermittently rotate the disk, these movements depending upon the arrangement of the fractions of the scale which are being added and with which the said pins correspond, as will be hereinafter fully explained.

H denotes a "whole-number" wheel, which is suitably pivoted to a post *k'*, formed on the base A, and is concealed under the annulus or plate B. The numerals on this wheel are arranged in an annular series and normally set to expose "0" through an inspection-aperture (indicated by the letter *l'*) provided in the ring *b* and through a coinciding aperture in the subjacent annulus or plate B, as more clearly shown in Figs. 1 and 3 of the drawings. Said whole-number wheel H is provided with ratchet-teeth which are adapted to be engaged by a pawl *m'*, pivoted to the bottom of the disk. This pawl is pressed toward the wheel by means of a suitably-supported coiled spring *n'* and is limited in its outward movement by means of a stop *o'*, projecting from the wheel, as clearly shown in Fig. 7 of the drawings, the said disk being represented by dotted lines. It will be understood that this pawl *m'* is so arranged in relation to the ratchet-teeth of the wheel as to cause the wheel to turn sufficiently to expose a succeeding numeral at each complete rotation of the disk. To the wheel H is fastened the inner end of a spiral spring I, the outer end of which spring is fastened to a rigid

stud or pin p', projecting upwardly from a case I^2, inclosing the spring, as shown in Figs. 3 and 7 of the drawings. This spring serves to return the wheel to its normal position when the operation of adding is completed.

a^2 denotes a pawl which is pivoted to the under side of the annulus or plate B and is held in engagement with the ratchet-teeth of the said wheel by means of a suitably-supported coiled spring b^2. This pawl a^2 serves to hold the wheel in opposition to the spring.

I′ denotes a manually-operated push-rod, which is supported in the wall a of the base A and is employed for moving the pawl a^2 out of engagement with the ratchet-teeth of said wheel H to permit the spiral spring I to automatically turn the wheel H to its normal position—*i. e.*, to expose "zero" through the aforesaid aperture l' in the ring b on the top of said wall a. This is necessary when the adding is completed. To limit this reverse rotation of the wheel, I provide the same with a lug c^2, which engages a stop d^2, consisting of a similar lug provided on the top of the wall a of the base. The aforesaid rod I′ is provided with a rigidly-mounted sleeve e^2, which serves as a handle for pushing the rod inward and drawing it outward. Said sleeve is provided with two annular grooves f^2 f^2, which are adapted to be engaged by a spring g^2, which may be supported in any suitable manner. This engagement of the spring and grooves serves to lock the rod in its inward or outward position.

Having described the construction of the instrument, I will proceed to first explain the manner of adjusting the parts thereof, and then the operation of the instrument.

It will be understood that in order to render the instrument operative it is necessary to wind the mainspring E. This is accomplished by rotating the disk D to the left. During this rotating the spring-pressed pawl n is held in engagement with the ratchet-wheel m, and at the same time all of the pins l l are necessarily in raised positions, so as to prevent their coming in contact with the detent a', said pawl serving to temporarily prevent the disk from rotating in the opposite direction and the resultant unwinding of the spring. When the spring is thus wound, the primary pin (indicated at x) is depressed. Then the rod F is pushed inward to cause the pawl n to disengage the ratchet-wheel m and automatically locked in its inward position to retain the said pawl in disengaged position. This disengagement of the pawl releases the disk, whereby it is permitted to be rotated by the spring to the right, during which rotation the said depressed pin is caused to engage the detent a', thus setting the disk in operative position or at starting-point—*i. e.*, to cause the inspection-aperture j thereof to expose "0" or zero of the computing series of fractions, as shown in Fig. 1 of the drawings. It will be noted that during the rotation of the disk incident to its release by the aforesaid disengagement of the pawl the pawl m', carried on said disk, engages one of the ratchet-teeth of the whole-number wheel H during each revolution of said disk, which causes the wheel to be rotated, and thus set in an incorrect position and held there by the spring-pressed pawl a^2. This being the case, it is now required that the rod I′ be pushed inward to disengage the latter pawl from the ratchet-teeth of said wheel and hold the pawl in disengagement, so as to permit the spiral spring I to rotate the wheel in reverse direction. This latter rotation of the wheel H causes the lug c^2 thereon to engage the stop d^2, so as to present "0" or zero at the inspection-aperture l', and thus setting the said wheel in correct or starting position for computing.

The parts being set in their proper positions, as above stated, the instrument is rendered operative for accurately computing fractions, as will now be fully described.

As an exemplification it will be assumed that the fractions "$\frac{5}{32}$," "$\frac{21}{64}$," and "$\frac{41}{64}$" of the scale are to be added. Thus I proceed as follows: The disk being held by the engagement of the primary pin x with the detent a', I first depress the indicating-pin l corresponding to the fraction "$\frac{5}{32}$" and then operate the hereinbefore-described key-lever G, which lifts the pin x, thereby disengaging same from the said detent. This releases the disk D, whereby the spring E rotates the same in the direction indicated by the arrow in Fig. 1 of the drawings, thereby causing the depressed pin l to engage the detent, which has been forced to its normal position by the spring disposed under the forward end of the lever. The engagement of the pin l with the detent arrests the movement of the disk, in which instance the inspection-aperture j of the disk is caused to expose a corresponding fraction "$\frac{5}{32}$" of the computing series. I next depress the indicating-pin l corresponding to the fraction "$\frac{21}{64}$" of the scale and then operate the key-lever G as before, so as to raise the previously-engaged pin, whereby the disk is released and allowed to be rotated by the spring to carry the second pin l into contact with the detent, as aforesaid. The engagement of the second indicating-pin with the detent arrests the movement of the disk, which has at this time carried the aperture j to a position to expose the fraction "$\frac{37}{64}$" of the computing series. A third indicating-pin l, corresponding to the fraction "$\frac{41}{64}$" of the scale, is then depressed in the same manner and the key-lever operated as before, thereby releasing the previously-engaged pin l from the detent, whereby the rotated disk carries the third pin into engagement with said detent. The disk is now arrested in its movement, having exceeded a complete revo-

lution, and the pawl m', carried thereon, has engaged one of the ratchet-teeth of the whole-number wheel H and turned said wheel slightly to expose the numeral "1" through the inspection-aperture indicated by the letter l', and at the same time the aperture j of the disk exposes the fraction "$\frac{1}{8}$" of the computing series. Thus the instrument registers "$1\frac{1}{8}$," which is the sum of the fractions "$\frac{5}{32}$," "$\frac{2}{64}$," "$\frac{4}{64}$" represented by the manipulated pins. The fractions having now been computed, the primary or starting pin x is depressed and the lever G operated, thereby raising the previously-engaged pin l and permitting the disk D to be rotated until the pin x again engages the detent, thus retaining the disk in its normal condition—*i. e.*, with the aperture j exposing "0," or zero. After thus setting the disk, as just stated, the rod I′ is pushed inward to cause the pawl a to release the whole-number wheel H, whereby the spiral spring I is permitted to turn the wheel to its normal position to expose "0," or zero, through the aperture l', which movement of the wheel is limited by the lug c^2 thereof engaging the stop d^2, as hereinbefore described. The said rod I′ is then drawn out to permit the pawl a^2 to again engage the wheel H. It will now be seen that the instrument is in condition for computing another set of fractions.

It might be stated that in case the mainspring E needs rewinding after completing the computing operation the pin x should not be depressed; but the rod F is to be withdrawn so as to permit the pawl n to engage the ratchet-wheel m, whereby the disk D can be rotated to effect the winding of said spring, as hereinbefore stated.

What I claim is—

1. In an instrument for computing fractions, the combination of a base, a plate secured stationary to the base and provided with a graduated scale of fractions to be computed arranged in annular series, and an annular series of computing-fractions disposed within the scale series and concentric therewith and including a "zero-mark," a revoluble concentric disk pivoted centrally on the base and concealing the computing series and provided with an inspection-aperture normally exposing "zero," indicators adapted to be manipulated, carried on said disk and registering with the fractions of the scale, a spiral spring for automatically rotating said disk in one direction, a movable detent supported on the case and adapted to consecutively engage and disengage the manipulated indicators of the fractions to be computed to permit the disk to be rotated intermittently whereby the aforesaid aperture will expose a fraction of the computing series representing the sum of the added fractions corresponding to the said manipulated indicators, and manually-operated means for actuating said detent to control the engagement and releasing of said indicators as set forth.

2. In an instrument for computing fractions, the combination of a base, a plate secured stationary to said base and provided with a graduated scale of fractions to be computed arranged in annular series, and an annular series of computing-fractions disposed concentric within the scale series and including a "zero-mark," a revoluble disk pivoted centrally on the case and concealing the computing series and provided with an inspection-aperture normally exposing "zero," suitably-manipulated indicators carried on said disk and registering with the fractions of the scale, a spiral spring for automatically rotating said disk, a movable detent retaining the disk in normal position and disposed in the path of the consecutively-manipulated indicators to limit the movement of the disk and operative for releasing the indicators to cause the disk to be moved intermittently and resultant exposure of increasing fractions of the computing series correspondingly with added scale-fractions represented by the manipulated indicators, and a manually-operated lever pivoted on the case for actuating said detent as set forth.

3. In an instrument for computing fractions, the combination of a base, an annular plate secured stationary to said base and provided with a graduated scale of fractions to be computed, said fractions being arranged in a number of annular series, and those of each series having like denominators, and the plate also provided with a single computing series of corresponding fractions graduated in reverse direction, a revoluble disk pivoted centrally on the base and having its peripheral portion concealing the computing-fractions and provided with an inspection-aperture disposed to expose the latter fractions one at a time and normally exposing "zero," a concealed "whole-number" wheel, the base provided with an inspection-aperture disposed to expose the numbers of said wheel and normally exposing "0," means imparting intermittent rotation from the disk to said wheel, indicators carried on the aforesaid disk and corresponding to the scale-fractions and adapted to be manipulated in accordance with the fractions to be added, means for automatically rotating said disk in one direction, a movable detent serving to restrain the disk against rotation, means for actuating said detent to release the disk to permit the latter to move intermittently whereby the indicators of the fractions to be computed are consecutively moved to a predetermined point to cause the aperture at the whole-number wheel to expose a numeral and the aperture of the disk to expose a fraction of the computing series, said exposed numeral and frac-

tion being the sum of the added fractions represented by the corresponding manipulated indicators as set forth.

4. In an instrument for computing fractions, the combination of a base, an annular plate secured stationary to said base and provided with a graduated scale of fractions arranged in annular series and an annular series of computing-fractions graduated in reverse direction, and including "zero," a revoluble disk pivoted centrally on the base and concealing the computing series and provided with an inspection-aperture for exposing the fractions of the latter series, one at a time, and normally exposing "zero," suitably-manipulated indicators carried on said disk and corresponding with the fractions of the scale, a spiral spring for automatically rotating the disk, a manually-actuated detent for restraining the disk against rotation and releasing the same and governed in its action by the manipulated indicators to cause the latter to be moved consecutively to a predetermined point, a concealed "whole-number" wheel including "zero" and provided with ratchet-teeth, the base provided with an inspection-aperture disposed above said wheel and normally exposing "zero," a pawl carried on the disk and adapted to engage said ratchet-teeth at every complete rotation of the disk, by which rotation a numeral is exposed at the aperture of the base and a fraction is exposed at the aperture of the disk, the combined numeral and fraction being the sum of the added fractions represented by the manipulated indicators as set forth.

5. In an instrument for computing fractions, the combination of a base, a plate secured stationary on the base and provided with a graduated scale of fractions to be computed and with a corresponding set of computing-fractions, a "whole-number" wheel concealed under said plate and provided with ratchet-teeth, the case provided with an inspection-aperture normally exposing "zero" of said wheel, a revoluble disk pivoted centrally on the base and concealing the computing set of fractions and provided with an inspection-aperture, said aperture being disposed to be moved over said computing-fractions and normally exposing "zero," a spring for automatically rotating said disk, movable indicators carried on said disk and corresponding to the fractions of the scale, a manually-actuated detent, said indicators being manipulated to coöperate with said detent to cause the disk to rotate intermittently, a pawl carried on the disk and adapted to engage the ratchet-teeth of the "whole-number" wheel at each complete rotation of the disk to intermittently rotate the wheel to consecutively expose the numerals thereof, a spiral spring moving the wheel to its normal position, a spring-pressed pawl for holding the wheel in opposition to the spring, and manually-operated means for actuating the pawl to release the same as set forth.

6. In an instrument for computing fractions, the combination of a base provided with a stationary graduated scale of fractions to be computed, and a corresponding set of computing-fractions, a revoluble disk pivoted to the base and provided with an inspection-aperture moving over the computing-fractions, a spiral spring for automatically rotating said disk in one direction, means for winding said spring, a ratchet-wheel fastened to the disk, a spring-pressed pawl engaging said ratchet-wheel to lock the disk in opposition to the spiral spring, a manually-operated detent adapted to engage the disk subsequent to the disengagement of said pawl, movable indicators carried on the disk and corresponding to the fractions of the scale, and adapted to be manipulated relatively to the fractions to be added and adapted to be consecutively engaged and released by said detent, whereby the aforesaid disk is permitted to be rotated to cause its aperture to expose a fraction of the computing set, said fraction being the sum of the fractions corresponding to the manipulated indicators as set forth.

7. In an instrument for computing fractions, the combination of a base provided with a stationary graduated scale of fractions to be computed, and a corresponding set of computing-fractions, a revoluble disk pivoted to the base and provided with an inspection-aperture normally exposing a "zero-mark" and movable over the fractions of the computing set, a spiral spring connected to the disk and base for automatically rotating the disk in one direction and wound by the reverse rotation of the disk, a ratchet-wheel secured to the disk, a pawl adapted to engage said ratchet-wheel during the winding of the spring, a detent supported movably on the base, a manually-operated primary indicating-stop on the disk arranged to engage said detent, a manually-operated push-rod for throwing the aforesaid pawl out of engagement with the ratchet-wheel to permit the engagement of the stop with the detent to set the disk in operative position, supplemental indicating-stops on the disk registering with respective fractions and manipulative so as to be consecutively engaged and released by said detent, and thereby permit the disk to rotate intermittently and cause the aperture thereof to expose a fraction of the computing set, said exposed fraction being the sum of the added fractions corresponding with the manipulated supplemental stops as set forth.

8. In an instrument for computing fractions the combination of base, a plate mounted stationary the said base being provided with a graduated scale of fractions arranged

in annular series and "zero," and provided with an annular series of computing-fractions disposed concentric with the series of the scale, and graduated in reverse direction, the computing series including "zero" alined with "zero" of the scale series, a "whole-number" wheel pivoted to the base and concealed under the aforesaid plate and provided with ratchet-teeth, the base being provided with an inspection-aperture for exposing the numerals of said wheel, a revoluble disk pivoted to the base concentric with the series of fractions and concealing the fractions of the computing series and provided with an inspection-aperture normally exposing "zero," a spring for automatically rotating said disk, a manually-operated detent supported on the base, a set of indicator-stops consisting of vertically-movable pins supported on the disk and registering with the scale of fractions and normally in raised or inoperative positions, said pins adapted to be pressed down in accordance with the fractions to be added to cause the pins to consecutively engage said detent and be released thereby, a pawl carried on the disk and disposed to engage the ratchet-teeth of the "whole number" at each complete rotation of the disk, whereby a numeral of said wheel is exposed, and a continued movement of the disk causes the aperture thereof to expose a fraction of the computing series, said number and fraction being the sum of the fractions indicated by the manipulated pins as set forth.

9. In an instrument for computing fractions, the combination of a base, a stationary plate thereon consisting of an annulus and provided with a graduated scale of fractions to be computed and arranged in annular series, and provided with an annular series of computing-fractions, a "whole-number-computing" wheel concealed under said plate, the base provided with an inspection-aperture for exposing the numerals of the wheel consecutively, a revoluble disk pivoted to the base within the annulus and having its peripheral portion concealing the computing series and provided thereat with an inspection-aperture for exposing the fractions of the computing series, an annular series of vertically-movable stop-pins carried on the disk and corresponding to the respective fractions of the scale, a movable detent disposed to engage the depressed pins consecutively and to raise the pins to release the disk, a spiral spring automatically rotating said disk and controlled by the engagement and release of the pins, automatic means for locking the pins in their raised and depressed positions, a manually-operated lever for actuating said detent, a spring-pressed pawl carried on said disk to engage one of the aforesaid ratchet-teeth of the "whole-number-computing" wheel at every complete rotation of the disk to expose a numeral of said wheel, a spiral spring for returning the wheel to its normal position, a spring-pressed retaining-pawl engaging said ratchet-teeth, and a manually-operated push-rod arranged to actuate the latter pawl for releasing the wheel as set forth.

10. In an instrument for computing fractions, the combination of a base, a stationary plate thereon consisting of an annulus and provided with a graduated scale of fractions to be computed and arranged in annular series, and provided with an annular series of computing fractions, a spring-actuated revoluble disk pivoted to said base and provided with an inspection-aperture for exposing the fractions of the computing series, one at a time, and an annular series of vertical openings corresponding to the respective fractions of the scale, indicating-pins in said openings adapted to be consecutively depressed in accordance with the fractions to be added, spring-actuated bolts locking the pins in normal and depressed positions, a detent in the path of the depressed pins to limit the movements of the disk, a manually-operated lever for actuating said detent to raise the engaging pin and thereby release the disk and cause the aperture to expose a fraction of the computing series, said fraction being the sum of the added scale-fractions represented by the consecutively-manipulated pins as set forth.

11. In an instrument for computing fractions, the combination of a base, a stationary plate thereon consisting of an annulus and provided with a graduated scale of fractions to be computed and arranged in annular series, and provided with an annular graduated series of computing fractions, a spring-rotated disk pivoted to the base within the annulus and provided at its peripheral portion with a series of vertical openings disposed radially in lines with the fractions of the scale and provided with an inspection-aperture movable over the fractions of the computing series, annularly-grooved pins in said vertical openings and adapted to be depressed consecutively in accordance with the fractions of the scale to be added, a manually-operated detent supported on the case and serving to engage and release the depressed pins, whereby the disk is rotated intermittently and the inspection-aperture thereof caused to consecutively expose the increasing fractions of the computing series correspondingly with the fractions added and indicated by the depressed pins, the said disk provided with a series of radially-disposed horizontal sockets communicating with said vertical openings, spring-pressed bolts disposed in said sockets and adapted to engage the annular grooves of the said pins to lock the latter in their normal and depressed positions as set forth.

WILLIAM T. BREWER. [L. S.]

Witnesses:
J. J. LAASS,
L. H. FULMER.