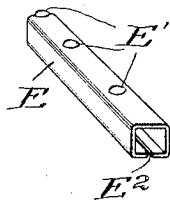
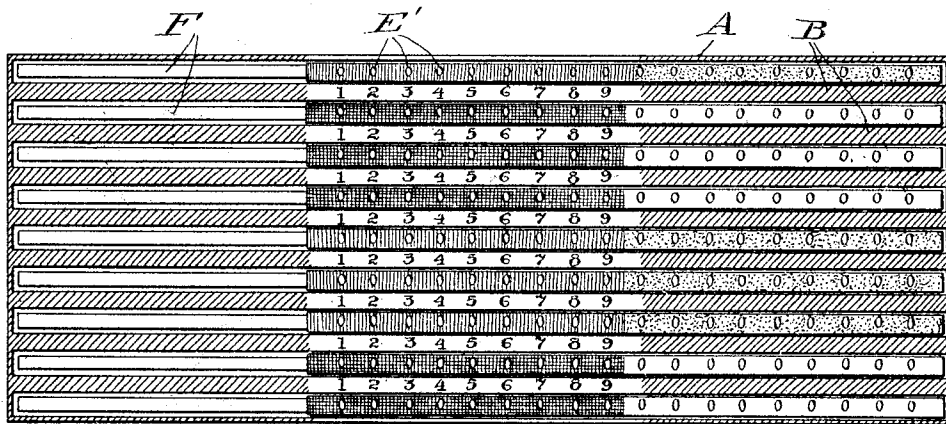
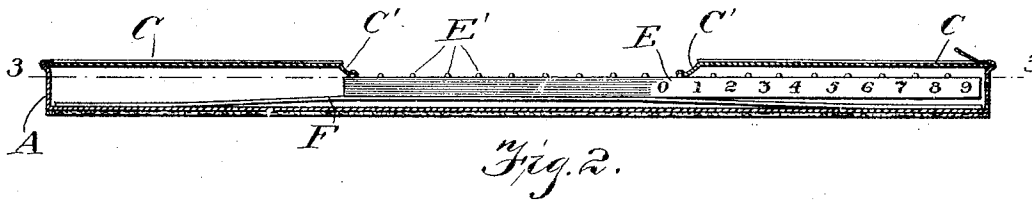
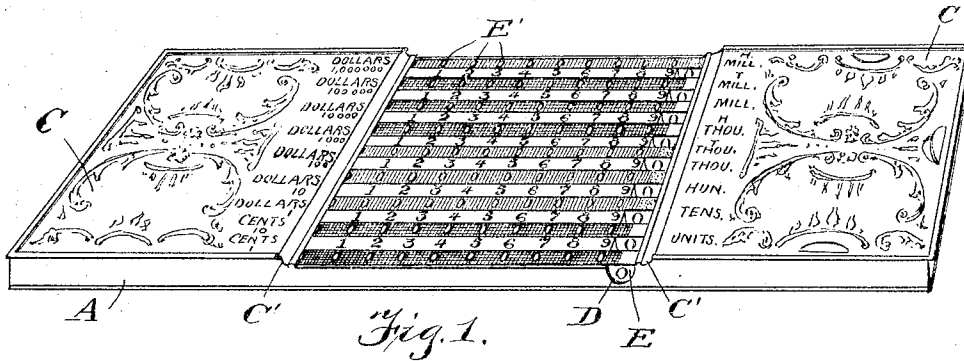


C. E. LOCKE.
CALCULATING MACHINE.
APPLICATION FILED APR. 29, 1904.



WITNESSES:
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Fig. 4.

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UNITED STATES PATENT OFFICE.

CLARENCE E. LOCKE, OF KENSETT, IOWA.

CALCULATING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 779,088, dated January 3, 1905.

Application filed April 29, 1904. Serial No. 205,475.

To all whom it may concern:

Be it known that I, CLARENCE E. LOCKE, a citizen of the United States, residing at Kensett, county of Worth, and State of Iowa, have invented a certain new and useful Improvement in Calculating-Machines, of which the following is a specification.

My invention relates to a new and useful improvement in calculating-machines, and is intended as an improvement over a patent in the same class of machines granted to me December 24, 1901, No. 689,680.

The object of this present invention is to improve upon the construction of the machine, to make the same more durable and more easily operated, and to provide an automatic means for locking the slides in place.

With these ends in view this invention consists in the details of construction and combination of elements hereinafter set forth and then specifically designated by the claims.

In order that those skilled in the art to which this invention appertains may understand how to make and use the same, the construction and operation will now be described in detail, referring to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a perspective view of my improved machine; Fig. 2, a central longitudinal section through the same; Fig. 3, a longitudinal horizontal section taken on the line 3 3 of Fig. 2; Fig. 4, a perspective view of one end of one of the slide-bars.

The machine comprises a suitable frame or casing A, having a series of parallel longitudinal guide-bars B. These guide-bars are covered at each end by the plates C, leaving the central portion of about one-third the length of the machine exposed. The guide-bars are upon the central exposed portion provided with numerals upon their upper surface, the numerals being "1" to "9," equally spaced in their regular sequence from left to right. Each guide-bar is cut away, as indicated at D, next to the right-hand plate, and these cut-away portions may be any shape desired, but preferably being U-shaped. Between the guide-bars and adapted to move from right to left or left to right are the sliding bars E. Each set of sliding bars is about twice as long as the

exposed portion of the guide-bars, and each sliding bar has upon its upper face a series of projections or knobs oval in plan view, the longest diameter of the knobs extending laterally across the bar. These knobs or projections are spaced at the same intervals as the numerals on the guide-bars, and when the slide-bars are at the limit of their movement in either direction one knob will be directly opposite each numeral. Each of the slide-bars have represented upon their front sides and upon the right-hand half of the slide-bars numerals from "0" up to "9." These numerals are spaced the same distance apart as the knobs or projections and numerals upon the guide-bars and are so arranged upon the slide-bars that when all of the slide-bars are in their extreme right-hand or normal position the naught upon each slide-bar will be in view through the cut-away portions D, as shown in Fig. 1. When any one of the slide-bars is moved to the left, the numeral corresponding to the number of spaces the bar has been moved will appear through the cut-away portion directly in front of said bar. The upper face of each of the slide-bars is colored in two different colors, one half of the bar being a dark color and the other half a lighter color. Of course there may be as many bars as desired to add up larger amounts; but in the drawings I have shown nine bars, representing units, tens, hundreds, thousands, tens of thousands, hundreds of thousands, millions, tens of millions, and hundreds of millions, these denominations being marked upon the plates directly opposite the bars.

In adding up a column of figures each horizontal row of figures is taken at a time, and each sliding bar is moved according to the decimal notation of each figure—as, for instance, if the first horizontal row of figures were eight hundred and twenty-seven dollars and fifty-one cents the operator's finger would be placed upon the right of the knob opposite the figure "8" upon that slide opposite the hundred dollars, and this slide would be moved to the left until stopped by the left-hand plate, then the next slide immediately below would be operated by placing the finger to the right of the knob opposite

the figure "2" and moving said slide to the left as far as possible, the same way with the slide next below the one-dollar slide by placing the finger to the right of the "7" and moving to the left, and so on with the other slides representing ten cents and one cent by placing the finger to the right of the knobs opposite the "5" and "1," respectively, and moving to the left. It will then be seen that, reading from the top, the numerals "82751" will appear in the cut-away portions. Now if, for instance, we wish to add to this number three hundred and fifty-one dollars and twenty-seven cents, the slide lettered "One hundred dollars," or the fifth slide from the bottom, would again be moved; but it would then be found that the knob or projection on this slide opposite the figure "3" was on a light color instead of a dark, and when this occurs the slide must be moved to the right instead of the left until it is stopped by the finger coming in contact with the right-hand plate, and in such a case the slide immediately above this slide must be then moved one space to the left. This will show "1" upon the thousand-dollar slide. Then by moving all of the other slides below according to the numbers "5," "1," "2," "7" it will be found that the numerals appearing in the cut-away portions will be "117878." Whenever the naught occurs in the numerals, the slide is not moved at all, and when any slide is moved to the left the finger is placed to the right of the proper knob, and when the slide is moved to the right the finger is to be placed to the left of the proper knob.

It is believed that the operation of this class of machines is now so well understood that it is not necessary to go any further in the description of the operation or enlarge upon the different results which may be attained with this machine.

It will be noted in the drawings that the colors upon the slides are varied, so as to avoid confusion, the ten-cent and one-cent slides being the same color, the one-dollar, ten-dollar, and hundred-dollar slides being of another color, and the one-thousand, ten-thousand, and hundred-thousand slides being of another color or the same color as the cent-slides, and the one-million-dollar slide being of another color. The colors upon the bars are thus arranged in groups corresponding to the arrangement of figures in ruled columns.

In order to prevent the sliding bars being moved accidentally by the jarring of the machine or by friction with the sleeve of the operator, I provide within the guideway underneath each slide-bar a flat spring F, the natural tendency of said spring being to bow upward in the center, as shown in Fig. 2, thus always bearing upward upon the slide-bars and pressing said slide-bars upward toward the end plates. The inner edges of these plates are bent down at an angle toward the bars, and the extreme inner ends of these

angular portions of the plates are bent so as to form a groove upon the under side, and the end plates are so arranged that each time a bar is moved and comes to a stop one of the knobs will be underneath the grooves, and the springs will press these knobs upward into the grooves, and therefore will prevent the bars moving accidentally, as said bars must be depressed slightly before they can be moved. The angular edges of the plates are also of great importance, as they allow the finger of the operator to ride upward upon the plate when the sliding bars are moved.

The sliding bars E are made of sheet metal, the metal being folded longitudinally, the ends meeting underneath at the point E', as shown in Fig. 4, so as to form a hollow bar, the knobs or projections E' being previously punched upward out of the metal.

The improvements and advantages which I claim over my former above-mentioned patent and upon which I desire to secure protection are as follows: the general design of the machine, as far as contributed to by the improved construction, the spring-locking device under each slide, the colors upon the slides being arranged in groups, the shape of the edges of the end plates, which gives accuracy and ease to the manipulation of the machine, the special shape of the knobs on the slides, oval instead of round, affording a sharper hold for the fingers, making it less likely that they will slip in rapid work, also affording more space between the knobs, thus avoiding confusion as to which figure a certain knob may correspond, the metal slide as a whole formed from a single piece of sheet metal.

Of course I do not wish to be limited to the exact construction here shown, as slight modifications could be made without departing from the spirit of my invention.

Having thus fully described my invention, what I claim as new and useful is—

1. A calculating-machine comprising a frame having a series of spaced stationary guides provided with cut-out portions or apertures at corresponding points, each having consecutive numerals on its upper face, a series of bars adapted to slide between said guides, each bar being bent from a single sheet of metal so that said bars will be in tubular form, each sliding bar provided with consecutive numerals on its front face, said numerals being adapted to show through the openings of the guides, plates extending across above the slides under which the slides are adapted to move, the inner edges of said plates provided with grooves upon the under side, knobs or projections formed upon the upper surface of the bars, said knobs being spaced the same as the numerals, and springs arranged underneath each slide, the tendency of said springs being to force the slides upward to cause the knobs or projections to en-

ter the grooves in the plates, as and for the purpose specified.

2. A calculating - machine comprising a frame having a series of spaced stationary guides, plates arranged above the guides upon each side of the frame, leaving a central exposed portion, each of said guides provided with cut-out portions or apertures at corresponding points, each of said guides provided upon its upper face with consecutive numerals within the exposed portion, a series of tubular slides arranged to slide between said guides, and each provided with consecutive numerals upon its front face, said numerals adapted to show through the openings of the guides, the inner edges of the plates inclining downward and inward toward the slides, flat springs arranged within each of the guide-ways and tending to force the slides upward in contact with the inclined edges of the plates, as and for the purpose specified.

3. A calculating - machine comprising a frame having a series of spaced stationary guides extending longitudinally of the machine, plates arranged above the guides at each end leaving a central exposed portion, the inner edges of said plates being inclined downward and inward toward the guides, said guides provided with cut-out portions or apertures next to the inner edges of the right-hand plate, the upper face of said guides provided with numerals from "1" to "9" arranged at equal distances apart and in regular

sequence from left to right, said numerals being in the exposed portion of the machine between the left-hand plate and the cut-out portion of the guide, a series of tubular bars arranged to slide between the guides, said bars being about twice the length of the exposed portion of the machine, each of the bars being provided with projections or knobs extending upward from the upper surface of the slides, said knobs being the same distance apart as the numerals and being oval in plan view, their lateral diameter being the greatest, each half of each bar being colored a different color, the darker colors upon one end of the bar and the lighter upon the other, and the colors upon each end being varied and arranged in groups, the front face of the right-hand end of each slide-bar being provided with numerals from "0" to "9" and arranged in regular sequence from left to right the same distance apart as the other numerals upon the guides, and springs arranged beneath each slide-bar tending to force said slide-bar in contact with the inclined edges of the plate, as specified.

In testimony whereof I have hereunto affixed my signature in the presence of two subscribing witnesses.

CLARENCE E. LOCKE.

Witnesses:

N. E. HAUGEN,
A. J. SUNYLAND.