

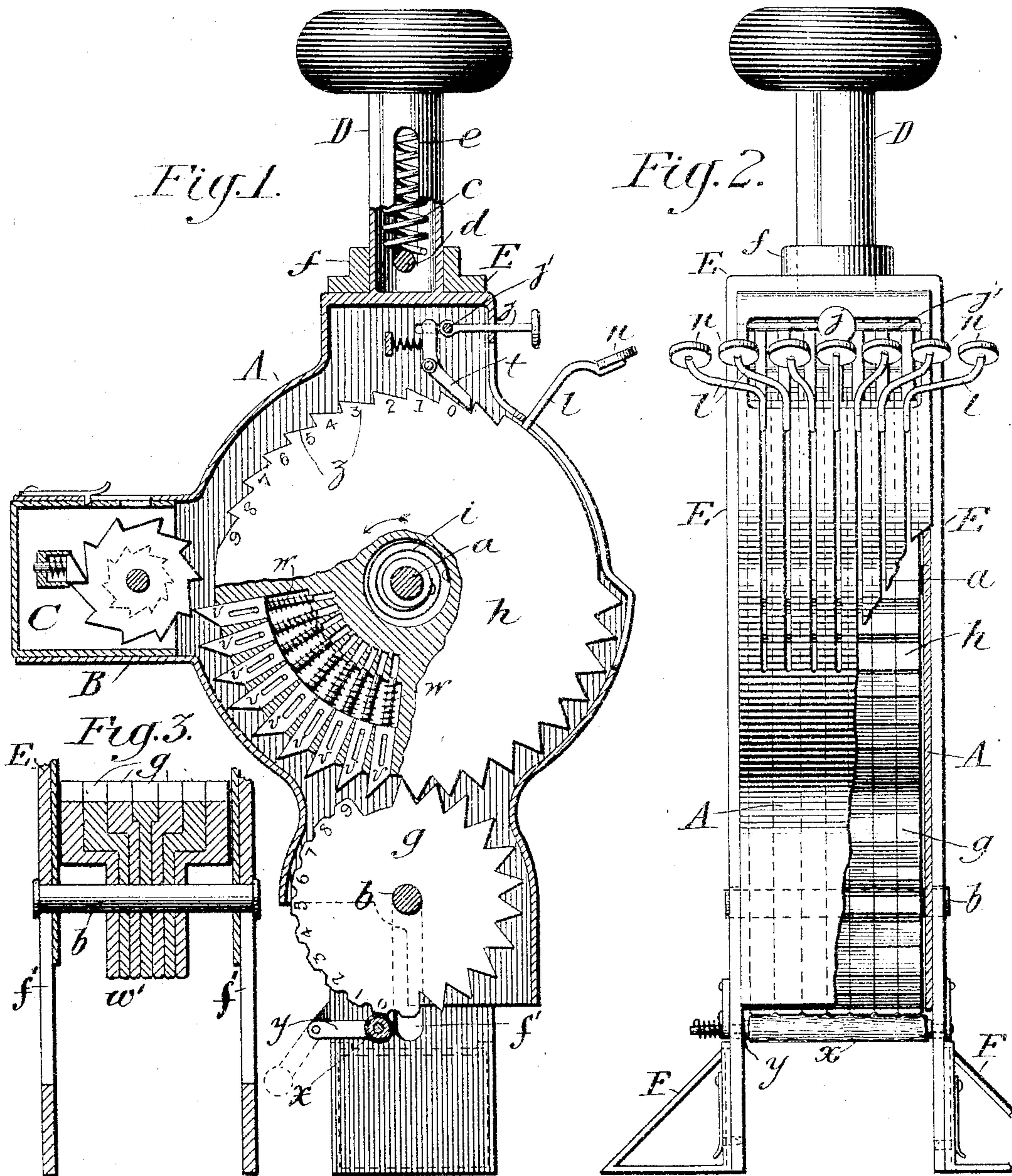
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W. W. CHILDS.

MACHINE FOR PRINTING AND TOTALIZING LINES OF NUMERALS.

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Witnesses:
D. W. Edlin.
C. J. O'Neill

Inventor:
W. W. Childs,
by Lemuel & Goldborough,
Attys.

UNITED STATES PATENT OFFICE.

WILLIAM WALLACE CHILDS, OF WASHINGTON, DISTRICT OF COLUMBIA.

MACHINE FOR PRINTING AND TOTALIZING LINES OF NUMERALS.

SPECIFICATION forming part of Letters Patent No. 778,741, dated December 27, 1904.

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To all whom it may concern:

Be it known that I, WILLIAM WALLACE CHILDS, a citizen of the United States, residing in the city of Washington, District of Columbia, have invented certain new and useful Improvements in Machines for Printing and Totalizing Lines of Numerals; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to certain new and useful improvements in machines for printing lines of numerals and for registering, recording, and totalizing the same.

The main purpose of the invention is to produce an apparatus of relatively light, compact, and simple structure particularly adapted to the uses of statisticians, accountants, and others whose duties require them to enter in books columns of numerals and to add their totals. For these and analogous uses it is desirable that the entire apparatus be sufficiently light and small to be readily shiftable and operable by hand after the fashion of the ordinary hand-stamp. For other purposes larger machines of similar design may be employed.

In the accompanying drawings, Figure 1 represents, partly in section and partly in elevation, one form of apparatus embodying my invention. Fig. 2 represents a front elevation thereof with a portion of the front casing broken away. Fig. 3 represents, in section, a modification of the arrangement of the printing-disks.

Similar letters of reference indicate similar parts throughout the several views.

Referring to the drawings, A indicates the main frame, within which are mounted the fixed shafts or journals *a* *b* and which is provided with a rear extension or pocket B for the reception of the frame or casing C of the totalizer. At its upper end the main frame A is provided with a hollow handle D, containing a spring *c*, reacting between a cross-pin *d* and the top of the handle. The cross-pin *d* passes through slots *e* of the stem of the handle and is rigidly attached at its ends to a flange *f* of the yoke E, within which the main frame A is mounted. Each end of the jour-

nal *b* enters a corresponding slot *f'* of the yoke, so that the main frame is appropriately guided in its up and down movements in the yoke by the slots *b* and *f'* at top and bottom, respectively.

To increase its stability, the yoke is preferably provided with wings F, forming lateral extensions at its base, but these extensions are preferably removable, so that they may be readily slipped on or off in order that the yoke may be brought close to the inner margin of the book-page when required.

The printing-disks *g* are mounted side by side upon the shaft *b*, upon which each is free to be rotated independently of the others. Each printing-disk is provided upon one portion of its periphery with a series of printing-dies, preferably ranging from "0" to "9," as indicated, preceded by a blank. It will be understood, however, that the zero-disk of the series may be dispensed with, together with its operating mechanism, by employing a "drop-cipher" in its stead, thereby reducing the number of printing-disks and operating devices by one. Opposite the printing-dies each of the disks *g* is provided with cogs adapted to intermesh with similar cogs of a corresponding setting-disk *h*.

Each setting-disk *h* is free to rotate independently of its neighbor and is connected to the stationary shaft *a* by means of a coiled spring *i*, whose tendency to uncoil is exerted in the direction of the arrow, Fig. 1. The cogs of each setting-disk correspond in number to those of the intermeshing printing-disk and occupy approximately a quadrant of the disk's periphery. The preceding quadrant is provided with a key *n* upon a lever *l*, these levers extending through slots of the front casing of the main frame A and being diverted to the right and left, as shown in Fig. 2, to give a wider keyboard. Beyond the cogs each disk *h* is provided with nine teeth *v*, located in recesses within which they are adapted to slide. Light springs *w* normally hold these nine teeth *v* in the protracted position shown, so as to be in the path of engagement with the totalizer-disks. Beyond the teeth *v* each setting-disk *h* is provided with a series of peripheral ratchet-teeth *z*,

corresponding to the cogs and printing-dies and bearing on their longer flat faces the numerals indicated on the sides in Fig. 1. With these ratchet-teeth engages a drop-pawl t .
 5 Each pawl acts independently of its neighbor; but the entire series is releasable by the headed push-rod j and cross-bar j' .

The totalizer is contained in the auxiliary casing C, which is adapted to be slipped into
 10 place in the extension or pocket B. It may consist of any suitable series of wheels or disks corresponding to the disks h and in line with teeth v of said disks and is provided with the customary carrying mechanism familiar
 15 to those skilled in the art.

One form of totalizer suitable for the purpose is illustrated, for instance, in United States patent to Landin, No. 482,312, dated September 6, 1892. (See particularly Figs.
 20 6, 7, 8, and 9 of said patent.)

The operation of the machine is as follows: When a given line of numerals is to be printed, the operator depresses in succession the several keys corresponding in order of sequence to the several denominations of the numerals (as tens, hundreds, thousands, &c.) until, as read through the front casing, the numerals shown on the flat faces of the ratchet-teeth z coincide with the desired line. The
 30 actuation of these keys causes a commensurate rotation of the corresponding setting-disks h , to which they are attached, and also of the printing-disks intermeshing with the setting-disks actuated. Consequently the
 35 printing-dies corresponding to the desired line of numerals are brought into the printing position and held thereat, the pawls t preventing retrograde movement. In the meantime the teeth v of each setting-disk have actuated upon the corresponding disk of the totalizer and made an appropriate registry thereon of the line of numerals, adding it to the former registry if a former line of numerals
 40 has already been registered. A downward blow or pressure upon the knob or handle thereupon prints the line of numerals at the desired place in the book. Upon releasing the pawls by the push-rod j the various parts are all restored to the adjustment indicated
 45 in the drawings ready for the setting and printing of a new line. In this return movement those of the teeth v which have actuated the totalizer-disks slide rearwardly within their recesses as against the tension of their individual springs and after passing the
 50 totalizer are again protracted into their normal positions by the action of said springs.

In Fig. 3 I have shown a sectional view of a modified construction of the printing-disks.
 60 In this figure the cogged sectors of the printing-disks are, as before, of the same thickness as the cogs of the setting-disks; but in order to print smaller figures arranged more closely together the printing-dies are carried by a series
 65 of thinner plates or sectors w' , which sectors

are connected to the several cog-sectors by cylindrical sections nested one within the other, as shown. In order to bring the lines themselves closer together, the disposition of the dies upon the peripheries of the sector and
 70 the relation of transmission of the cogs of the two series of disks may be correspondingly varied.

In the drawings I have indicated an inking-roller x , mounted upon spring-arms y , for
 75 supplying ink to the printing-dies. It is evident, however, that the means for inking the dies may be varied or that it may be entirely omitted where, for instance, the dies are of the cutting, indenting or perforating kind.
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It will be noted generally that the machine is adapted not only for use as an adding-machine, but also permits the operator to perform other mathematical operations, such as multiplication, subtraction, division, and
 85 extraction of the square root. This can be done by appropriate manipulation of the keys, and the result can then be printed, the totalizer in the meantime being removed, if desired. Broadly considered, therefore the machine is a combined calculator and printer, and
 90 as such is capable of a correspondingly wide range of uses.

Having thus described my invention, what I claim is—
 95

1. A hand-stamp, provided with a series of setting-disks, a series of disks carrying numeral-dies, and a totalizer differentially operated by said setting-disks; substantially
 100 as described.

2. The combination in a hand-stamp, of a support, and a frame carrying printing devices, totalizing devices and means for differentially operating the same, said frame being
 105 movable to force the printing devices against the printing-surface; substantially as described.

3. A hand-stamp, provided with setting-disks each provided with a spring for returning it to the initial position and with a ratchet
 110 and pawl for retaining it temporarily in a set adjustment, means for actuating the several setting-disks, and a series of disks bearing numeral-dies intermeshing with the setting-disks; substantially as described.
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4. A hand-stamp, provided with setting-disks, each provided with a spring for returning it to the initial position and with a ratchet
 120 and pawl for retaining it temporarily in a set adjustment, means for actuating the several setting-disks, means for tripping all of said disks simultaneously, and a series of disks bearing numeral-dies intermeshing with the setting-disks; substantially as described.
 125

5. A hand-stamp provided with setting-disks, each provided with a spring for returning it to the initial position and with a ratchet
 130 and pawl for retaining it temporarily in a set adjustment, means for actuating the several setting-disks, a series of spring-seated teeth,

a totalizer whose disks are located in the path of movement of said teeth, and a series of disks bearing numeral-dies intermeshing with the setting-disks; substantially as described.

5 6. A hand-stamp, provided with a casing, setting-disks and printing-disks intermeshing therewith mounted within the casing, and an outer standard within which the casing is movable; substantially as described.

10 7. A hand-stamp, provided with a casing, setting-disks and printing-disks mounted within the casing, a supplemental removable casing containing a totalizer, and an outer standard within which the main casing is movable; substantially as described.

15 8. A hand-stamp, provided with a casing, setting and printing disks, mounted within the casing and intermeshing with each other, the printing-disks having their dies mounted upon sectors thinner than their intermeshing portions and ranged close together; substantially as described.

20 9. A hand-stamp, provided with a casing, setting and printing disks mounted within the casing, an outer standard within which the casing is movable, and removable basal wings or extensions for said standard; substantially as described.

25 10. A hand-stamp, provided with a series of setting-disks and a series of calculating and printing disks intermeshing therewith; substantially as described.

30 11. A hand-stamp, provided with a series of setting-disks and a series of printing-disks intermeshing therewith, and a totalizer adapted to be thrown into or out of engagement with the setting-disks; substantially as described.

35 12. The combination of a series of setting-disks, a fixed shaft about which said disks are
40 revoluble and to which they are connected by

central springs, the periphery of each of said disks being provided with a series of cogs, resilient teeth, and ratchet-teeth, in succession thereon and having an actuating key-lever, a corresponding series of cogged printing-disks, 45 and a totalizer adapted to be operated by the resilient teeth; substantially as described.

13. The combination of a series of setting-disks, a fixed shaft about which said disks are revoluble and to which they are connected by 50 central springs, the periphery of each of said disks being provided with a series of cogs, and ratchet-teeth, in succession thereon and having an actuating key-lever, and a corresponding series of cogged printing-disks intermeshing with the cogs of said setting-disks; 55 substantially as described.

14. In a hand-stamp, a series of actuating-disks, provided with resilient teeth, in combination with a totalizer having a corresponding series of disks in the path of movement of 60 said teeth; substantially as described.

15. In a machine of the kind described, a series of key-actuated disks, arranged side by side and each provided with its individual key-lever for advancing it step by step, each of said disks bearing on its periphery a series of numerals, ratchet-and-pawl mechanism for temporarily locking the individual disks in the position to which they are brought by the central 70 springs, pawl-releasing mechanism, and springs for returning the disks to their initial position upon the release of the pawls; substantially as described.

In testimony whereof I affix my signature in 75 presence of two witnesses.

WILLIAM WALLACE CHILDS.

Witnesses:

JOHN C. PENNIE,
W. G. HOWELL.