

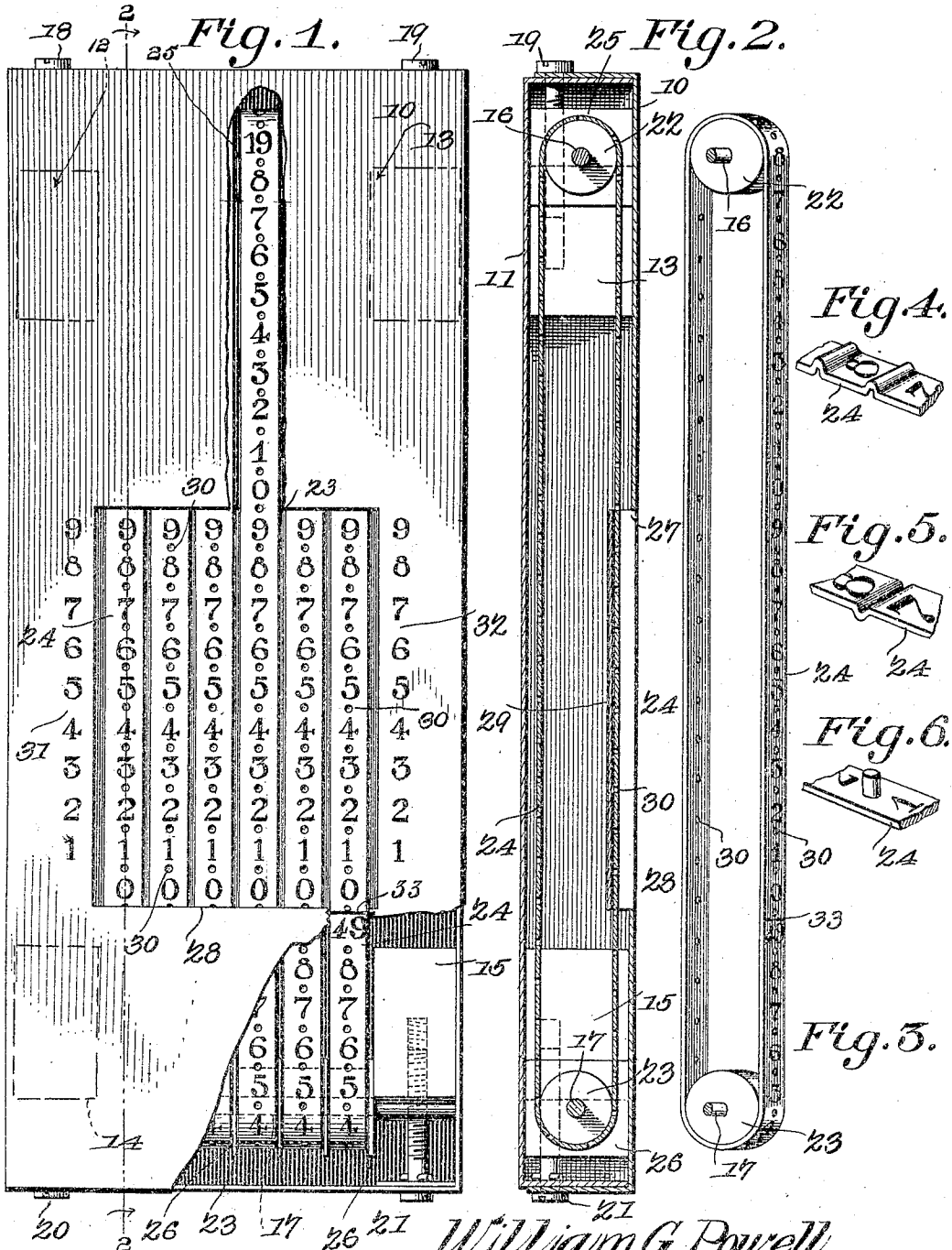
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W. G. POWELL & F. A. WILLIAMS.
ADDING MACHINE.

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NO MODEL.



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UNITED STATES PATENT OFFICE.

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ADDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 773,675, dated November 1, 1904.

Application filed June 17, 1904. Serial No. 212,986. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM G. POWELL, a citizen of the United States, and FRANCIS ALBERT WILLIAMS, a subject of the King of Great Britain, both residing at Jacksonville, in the county of Duval and State of Florida, have invented a new and useful Adding-Machine, of which the following is a specification.

This invention relates to the class of calculating instruments or devices, more particularly to those designed for adding columns of figures, and has for its object to simplify and improve the construction of such devices without detriment to the efficiency of the same.

Another object of the invention is to produce a device of this character wherein the labor of computation is materially decreased.

With these and other objects in view, which will appear as the nature of the invention is better understood, the same consists in certain novel features of construction, as hereinafter fully described and claimed.

In the accompanying drawings, forming a part of this specification, and in which corresponding parts are denoted by like designating characters, is illustrated the preferred form of the embodiment of the invention capable of carrying the same into practical operation, it being understood that the invention is not necessarily limited thereto, as various changes in the shape, proportions, and general assemblage of the parts may be resorted to without departing from the principle of the invention or sacrificing any of its advantages, and the right is therefore reserved of making all the changes and modifications which fairly fall within the scope of the invention and the claims made therefor.

In the drawings thus employed, Figure 1 is a plan view, partially in section, of the improved device. Fig. 2 is a sectional view on the line 2 2 of Fig. 1. Fig. 3 is a perspective view of one of the endless graduated belts and a pair of its guide-pulleys detached. Figs. 4, 5, and 6 are views of portions of one of the graduated belts, illustrating modifications in the construction.

The improved device comprises an inclosing oblong casing having spaced top 10 and bottom 11 and with ends and sides, the whole preferably of sheet metal and with the top and bottom members disposed in parallel lines. Disposed within the casing, near each corner, are four blocks 12 13 14 15, having means for supporting two shafts 16 17 transversely of the casing and near its ends. Adjusting-screws 18, 19, 20, and 21 are disposed for rotation through the ends of the casing and tapped into the blocks to provide for the adjustment of the same and the shafts carried thereby longitudinally of the casing.

Mounted for independent rotation upon the shafts 16 17 are band-pulleys 22 23, arranged in opposite pairs for supporting an endless flexible band 24 upon each opposite pair of the same.

Engaging the shafts 16 17 between the pulleys 22 23 are spacer-blocks 25 26, opposite edges of the blocks being in contact with the inner faces of the top and bottom members 10 11, and thus serving not only as means for maintaining the pulleys and bands in proper position, but also to support the shafts intermediately of the end blocks and between said members 10 and 11. It will be noted by this arrangement that the blocks 25 26 move with the shafts 16 17 and the supporting adjusting-blocks 12 13 14 15, and all the parts are thus maintained at all times in the same relative position.

The cover member 10 is provided with spaced clefts 27 and 28 and the portion of the metal between these clefts depressed to form a sunken central floor 29, and the bands 24 are so disposed that this depressed floor-section forms a central support for the upper or outer runs of the bands and prevents them from sagging when operated. The bands are provided with apertures 30 or with projections, pins, or the like at intervals corresponding to the graduations to enable the bands to be rotated by a stylus or other implement or the finger of the operator.

In Figs. 4, 5, and 6 a variety of projections and depressions are shown in the band 24 to

illustrate the different forms of band-operating means; but we do not desire to be limited to any specific means for accomplishing this result. The graduations upon the bands will be in tens or multiples of tens and are preferably in sets or "blocks" of ten numerals, each running from "0" to "9" and repeat, as shown in Fig. 3, which represents a perspective view of one of the bands detached.

Opposite one of the numerals of each block, except those in the first block, preferably opposite the "9," a denoting numeral or character will be placed in progressive order from "1" to "5" or "10" or higher, according to the length of the band and the number of the blocks on the same. The bands may be of any required length and as ordinarily constructed will generally each be long enough to contain fifty numerals divided into five blocks of ten numerals each, with the denoting-numerals from "1" to "4" opposite the numeral "9" of each block from the second block upward.

On the outer case 11 at points adjacent to the vertical walls of the central depression are rows of digits 31 32, corresponding to the numerals on the bands and in transverse alignment with the same, these side columns being designed for indicating the sections or squares to be drawn down in operating the bands.

Impressed upon the band 24 between the numeral "9" of the last block and the "0" of the first block is a heavy line or mark 33 to denote the terminal of the set of numerals.

To operate the device, the band is drawn downward a distance corresponding to the number to be added, the proper square on the band being determined by consulting the indexes at the sides of the aperture, which indicate the point at which the band is to be engaged and moved until stopped by contact of the finger, stylus, or other device with the lower margin of the central opening. If the number to be added is in the "units-column," then the "units-band," or the one on the right, will be operated. If in the "tens-column," the second band from the right will be operated, and so on, as will be obvious. When the whole column of numerals is added, the operator will "carry" from the units-band to the "tens-band" the number indicated by whichever indicating-numeral on that (the units) band is in sight of the operator and from the tens-band to the "hundreds-band," the number indicated by whichever indicating-numeral on the tens-band is in sight, and so on until he has carried all the indicating-numerals in sight. This is a very important advantage gained by this construction, as by this arrangement the indicating-numerals obviate the necessity for employing "carrying" mechanisms in the device. If any of the indicating-marks 33 of the last block of numerals appear in the opening 27 before the operator has completed his addition, as soon as the mark 33 disap-

pears from view beneath the cover 10 he would carry a "5" to the next highest band and proceed as before, and so on throughout the operation. This action is based upon bands of fifty numerals divided into five blocks of ten numerals each; but in bands of one hundred numerals under the same circumstances the operator would carry a "1" to the second higher band, which would be equivalent to carrying "10" to the next higher band. It will also be noted that the numerals are not "carried" until the mark 33 has passed from view in the opening 27.

The arrangement of the bands is practically the same as if they were numbered consecutively from "0" upward, but are divided into blocks of ten for convenience of calculation. The bands will preferably be of flexible metal, but may be of any other suitable material.

Having thus described the construction and operation of our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a calculating-machine, a casing having spaced walls, blocks disposed within the casing and in slidable engagement with the walls, set-screws for adjusting the blocks, spaced shafts mounted in said blocks, a plurality of pulleys independently revoluble on the shafts, endless bands extending over the pulleys, and blocks carried by the shafts between said pulleys and serving to space the pulleys and the bands.

2. In a calculating-machine, a casing having at its outer face a central depression formed by depressing the material of which the casing is formed at a point between two parallel slits in the casing, spaced shafts mounted within the casing, band-pulleys mounted for independent rotation on said shafts, and endless bands carried by the pulleys and passing through the slits and on the exterior of the depressed portion of the casing-face.

3. In a calculating-machine, a casing having at its front wall an opening, a plurality of endless bands having portions of their lengths exposed at the opening, each of the bands carrying a number of blocks of digits disposed in consecutive order from "0" to "9," the length of the casing-opening being sufficient to expose a whole block at the same time, each of the blocks above the first being provided with a character designating the extent of movement of the band and the amount to be transferred to the band of the next highest value.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

WILLIAM G. POWELL.

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Witnesses:

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