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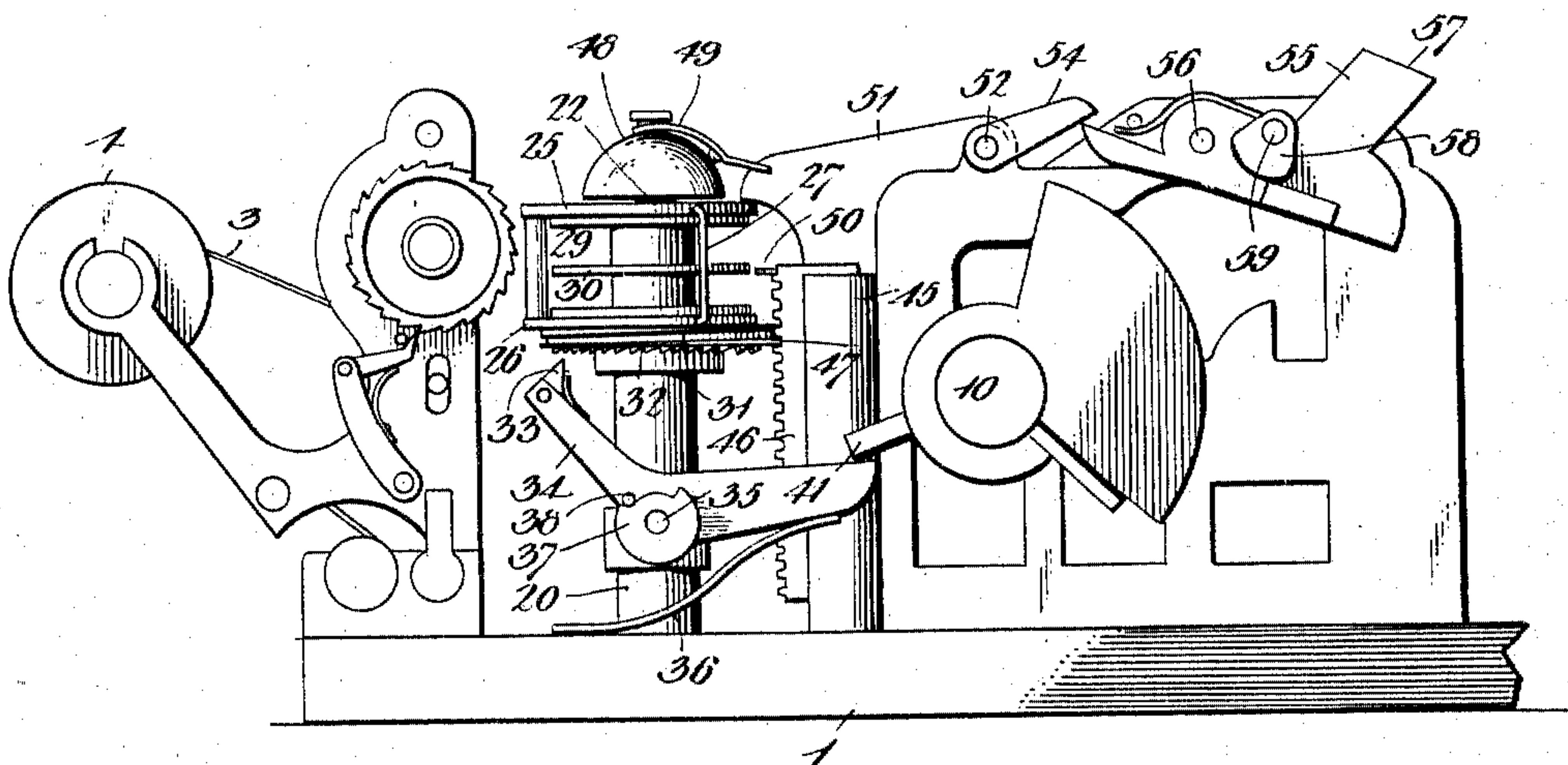
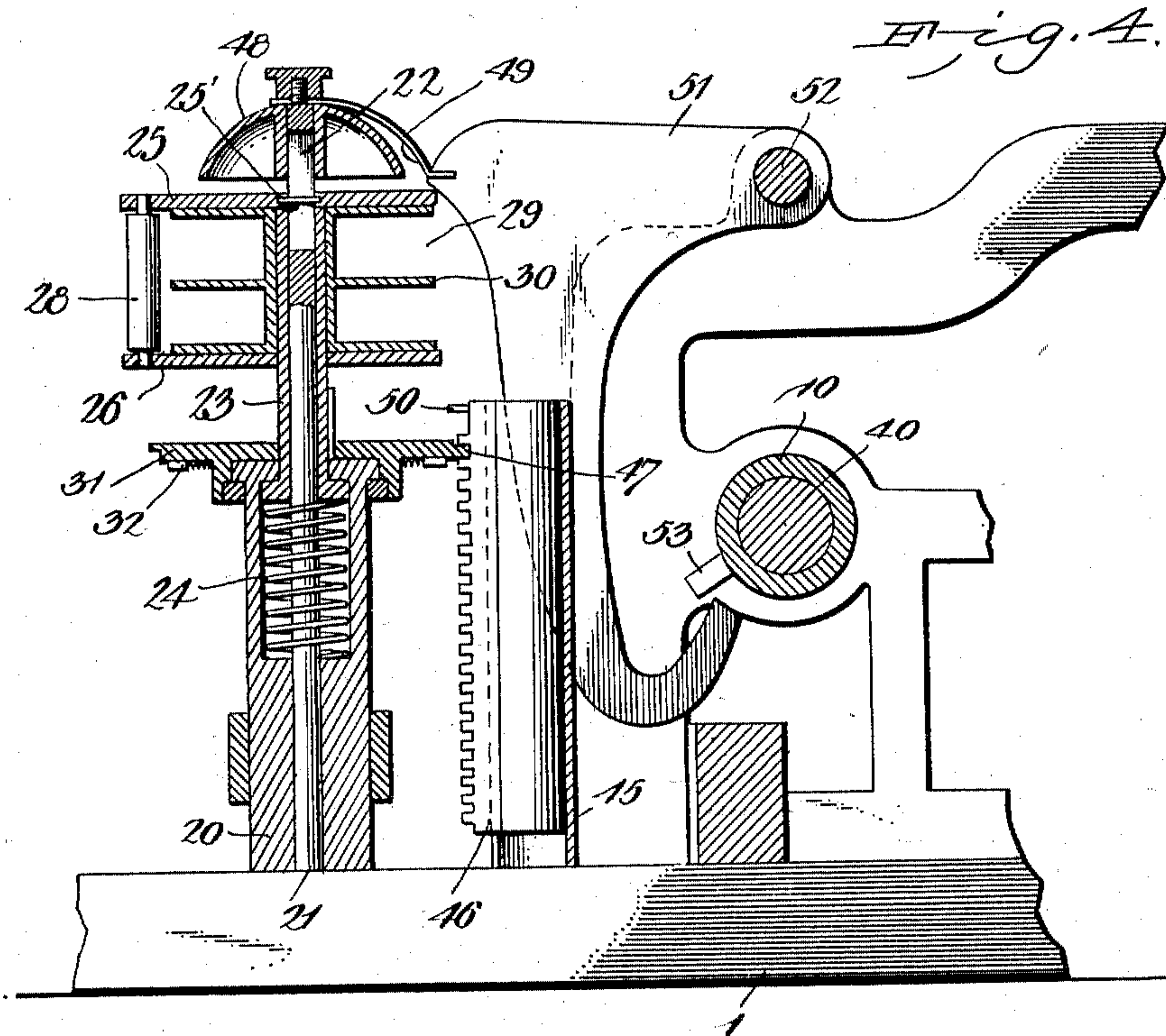
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RIBBON MECHANISM FOR CALCULATING MACHINES.

APPLICATION FILED OCT. 23, 1902.

NO MODEL.

2 SHEETS—SHEET 2.



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RIBBON MECHANISM FOR CALCULATING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 759,848, dated May 17, 1904.

Application filed October 23, 1902. Serial No. 128,472. (No model.)

To all whom it may concern:

Be it known that I, CLARENCE D. BAIRD, a citizen of the United States, residing at Alexandria, in the county of Dekalb and State of Tennessee, have invented a new and useful Ribbon Mechanism for Calculating-Machines, of which the following is a specification.

The present invention relates to certain improvements in calculating-machines, and more especially to machines of that class in which each horizontal row of numerals is separately recorded on a sheet of paper and the grand total is afterward printed at the bottom of the rows of numerals to complete the problem, and while the device is applicable to finger-key-operated mechanism of any class, including both type-writing, adding, subtracting, and other calculating machines, it is especially designed for use in connection with machines where it is desirable to imprint the factors, elements, or quantities of the problem in one color and the result in another or distinctive color in order to avoid confusion, especially where a number of calculations are imprinted on the same page or sheet.

One object of the invention is to provide a machine of this character with a plurality of ribbons of different colors and with means for bringing a ribbon of desired color into alinement with the imprinting-type.

A further object of the invention is to provide, in connection with a calculating-machine, a mechanism for altering the positions of the ribbons at the completion of a problem in order that the result or total may be printed in a distinctive color.

A still further object of the invention is to provide an improved form of ribbon-reel and ribbon-reel-actuating mechanism and to provide for the sounding of an alarm when one or other of the ribbon-reels is full.

With these and other objects in view the invention consists in the novel construction and arrangement of parts hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various

changes in the form, proportions, size, and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is a plan view, partly in section, of sufficient of a calculating-machine to illustrate the application thereto of a ribbon mechanism constructed in accordance with my invention. Fig. 2 is a side elevation of the same. Fig. 3 is a view of a portion of the mechanism shown in Fig. 2 with the parts in different position. Fig. 4 is a detail sectional view of one of the double ribbon-reels and a portion of the mechanism for automatically changing the position of the ribbons.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

The ribbon mechanism forming the subject of the present invention may be employed in connection with any form of machine in which finger-keys operate to adjust or to positively actuate type-bars or type-carrying devices, and in order to illustrate the application of the device there is shown in the drawings a frame 1, forming a part of a calculating-machine.

At the rear end of the frame are suitable supports for the reception of a platen 2, over which passes a sheet of paper 3 from a paper-roll 4, this mechanism being operated in any suitable manner. The horizontal plane of the platen is in alinement with the plane of type impressions, and with said platen coacts a number of type-bars, operated in any suitable manner to force the same when properly adjusted in the direction of the platen. In connection with other portions of the actuating mechanism is a main shaft 10, to which motion is imparted by a handled crank 11. This mechanism and the operation thereof is fully described in an application for United States Letters Patent for calculating-machine filed by me on the 23d day of October, 1902, under Serial No. 128,473.

At each side of the frame of the machine is

a standard 20, in which is secured a vertically-disposed spindle 21, having at its upper end a vertically-disposed slot 22. On the spindle is mounted a revoluble sleeve 23, the lower end of which extends within a recess in the standard and is provided with an annular flange or collar against which bears the upper end of a compression-spring 24, normally holding the sleeve in elevated position, while permitting free vertical and rotative movement of said sleeve on the stationary spindle 21. Surrounding the upper end of the spindle is a substantially circular plate 25, held from rotative movement by a diametrically-disposed pin 25' passing through the slot 22 of the spindle, and on the sleeve 23 is mounted a similar plate 26, connected to the plate 25 by a pair of guard-arms 27 and a small ribbon-guiding roller 28, the construction being such that the two plates while free to move vertically with the sleeve are held from rotative movement by the pin 25' or by other suitable means.

Between the upper and lower plates 25 and 26 is mounted a double ribbon-reel 29, divided into upper and lower portions by the horizontal disk 30. The hub of the reel is keyed to the sleeve and rotates therewith, while its two sections each receive a ribbon of different color.

To the lower portion of the sleeve 23 is secured a disk 31, having on its under side a circular row of ratchet-teeth 32, with which engages a pawl 33, pivotally mounted at one end of a lever 34, the latter being pivoted on a fixed stud 35, projecting from the outer face of the standard. The pawl-carrying lever 34 is normally held in the position shown in Fig. 2 by means of a plate-spring 36, the pawl being maintained wholly out of engagement with the ratchet-teeth in order to permit free movement of the disk in the event of the pawl at the opposite side of the machine being operated. The limits of movement of the pawl-carrying lever are determined by a fixed disk 37, secured to the end of the stud 35 and having a peripheral notch terminating in abrupt shoulders for engagement with a pin 38, projecting from the side of the lever.

In the present machine two ribbons are employed, the ribbons being of different color and extending lengthwise of the platen between the reels on the opposite sides of the imprinting-type, and normally the lowermost ribbon is maintained in the line of the type impressions in order to print the elements or the body of a problem in one color, while at the end of a problem both reels are depressed in order to bring the upper portions of the reels, carrying a ribbon of different color, into alinement with the types and effect the imprinting of the grand total in a distinctive color.

The shaft 10, before referred to, is hollow and receives a rod 40, from which extends two

radially-disposed arms 41, passing through suitable slots in the wall of the hollow shaft. The end of the rod has a reduced stem extending out beyond the end of the shaft and provided with a knob or handle 42 for convenience in effecting the longitudinal adjustment of the rod and moving one or other of the radial arms 41 into operative relation with one of the pawl-carrying levers 34. The distance between the two arms 41 is less than the distance between the two levers 34, so that only one of said arms can be adjusted to operative position, the ribbons being first wound on one reel, and when said reel is full the rod is shifted longitudinally to permit the operation of the actuating-pawl of the opposite reel.

In order to notify the operator when the reels are filled and of the necessity of shifting the position of the rod 40, I employ at each side of the machine an alarm mechanism of the character best shown in Fig. 4.

At a point adjacent to each of the standards 20 is a hollow standard 45, in which is guided a vertically-movable rack-bar 46, with which engages a worm-tooth 47, formed on the periphery of the ratchet-disk 31, the rack receiving a gradual vertical movement as the ratchet-disk rotates and the ribbon is wound. To the upper end of each stationary spindle 21 is secured an alarm-bell 48, having a spring-clapper 49, with which engages a pin 50, projecting from the upper portion of the rack 46, so that when the rack is elevated the pin will raise the end of the clapper and after passing beyond the same permit the downward movement of the clapper into contact with the bell.

During the course of operation of the calculating-machine the crank 11 is given a forward and thence a backward movement, the arms 41 acting on the pawl-carrying levers and positively rotating one or other of the ribbon-reels.

The shifting of the position of the ribbons may be accomplished in several ways, one of the shifting mechanisms comprising a pair of levers 51, rigidly secured to a cross-bar 52 in bearings at opposite sides of the frame, the free ends of said levers bearing on top of the guard-plates 25 of the reels. The lower ends of both levers are hook-shaped and are adapted to be engaged by arms 53, projecting radially from the hollow shaft 10, the shaft being turned by hand in order to effect the depression of the ribbon-reels and the movement of the upper ribbon into alinement with the types in advance of the printing operation. The shaft 10 is not turned to an extent sufficient to operate the levers 51 during ordinary imprinting operations, but is only moved to an extent sufficient to cause the arms 53 to engage said levers when a total amount is to be printed.

The movement of the reels may be accomplished independently of the shaft by any direct-acting adjusting means, or for convenience

this mechanism may be arranged as shown in Figs. 2 and 3, the shaft 52 being provided with an arm 54, adapted to engage one end of a lever 55, mounted on a stud 56 at one side of the frame. This lever 55 has an upwardly-extending portion 57, which may be engaged and depressed by hand, or it may be turned by means of a suitable cam 58, carried by a shaft 59, the latter being provided with a turning-knob at a convenient point outside the casing of the machine. In some cases the depression of the ribbon-reels may be accomplished by the radial arms 53 of the shaft and the reels afterward locked in position by the movement of the lever 55; but when the latter are employed to effect the depression of the reels independent of the shaft the lower hook-shaped ends of the levers 51 may be omitted.

Having thus described my invention, what I claim is—

1. The combination with printing mechanism, of a pair of ribbon-reels adapted for the support of a plurality of ribbons, means for maintaining said reels in elevated position, a pair of pivotally-mounted reel-depressing levers adapted one for engagement with each reel, a rock-shaft, and cams carried by the shaft and operable during the initial part of a total-printing operation to engage with and actuate said levers.

2. The combination with printing mechanism, including a platen, of a pair of oppositely-disposed ribbon-supports each comprising a recessed standard, a vertically-disposed slotted spindle carried by the standard, a vertically-adjustable and revoluble sleeve mounted on the spindle, a spring disposed within the recess of the standard and serving to elevate said sleeve, a pair of connected guard-plates, a pin connecting the upper of said plates to the slotted portion of the spindle, a double reel keyed to the sleeve, and means for imparting a step-by-step rotative movement to the sleeve and reel.

3. In a ribbon mechanism, a vertically-movable and revoluble reel-support, a double reel carried thereby, a ratchet-disk connected to the reel-support and revoluble therewith, means for holding the ratchet-disk from vertical movement, and means for imparting a

step-by-step rotative movement to said ratchet-disk.

4. A ribbon supporting and feeding mechanism, comprising a pair of ribbon-reels, ratchet-disks operatively connected thereto, a pair of pawl-carrying levers, pawls supported by the levers and adapted to engage the respective ratchet-disks, springs normally maintaining both pawls out of engagement with the ratchet-disks, a rock-shaft, and means carried by the rock-shaft for imparting movement to one or other of the pawl-carriers.

5. A ribbon supporting and feeding mechanism, comprising a pair of ribbon-reels, ratchet-disks operatively connected thereto, a pair of pawl-carrying levers, pawls supported by the levers and adapted to engage the respective ratchet-disks, springs normally maintaining both pawls out of engagement with the ratchet-disks, a hollow rock-shaft having radial slots, a longitudinally-movable rod carried by said rock-shaft, and a pair of radially-disposed arms carried by said rod and movable to engage one or other of the pawl-carrying levers.

6. A ribbon supporting and feeding mechanism, comprising a slotted supporting-spindle, a pair of connected non-revoluble guard-plates movable longitudinally with the spindle, a pin carried by the plates and extending through said slotted spindle, ribbon-guides carried by said plates, a ribbon-reel disposed between the guard-plates, and means for imparting a step-by-step rotative movement to said ribbon-reels.

7. The combination with a ribbon-reel, of a ratchet-disk connected and adapted to revolve the reel, a worm-tooth disposed on the periphery of said ratchet-disk, a rack with which said worm-tooth engages, a guide for the rack, an alarm-bell, and a clapper adapted to be engaged and actuated by the rack, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

CLARENCE D. BAIRD.

Witnesses:

ANNE BLACKBURN,
J. C. DOSS.