(No Model.)

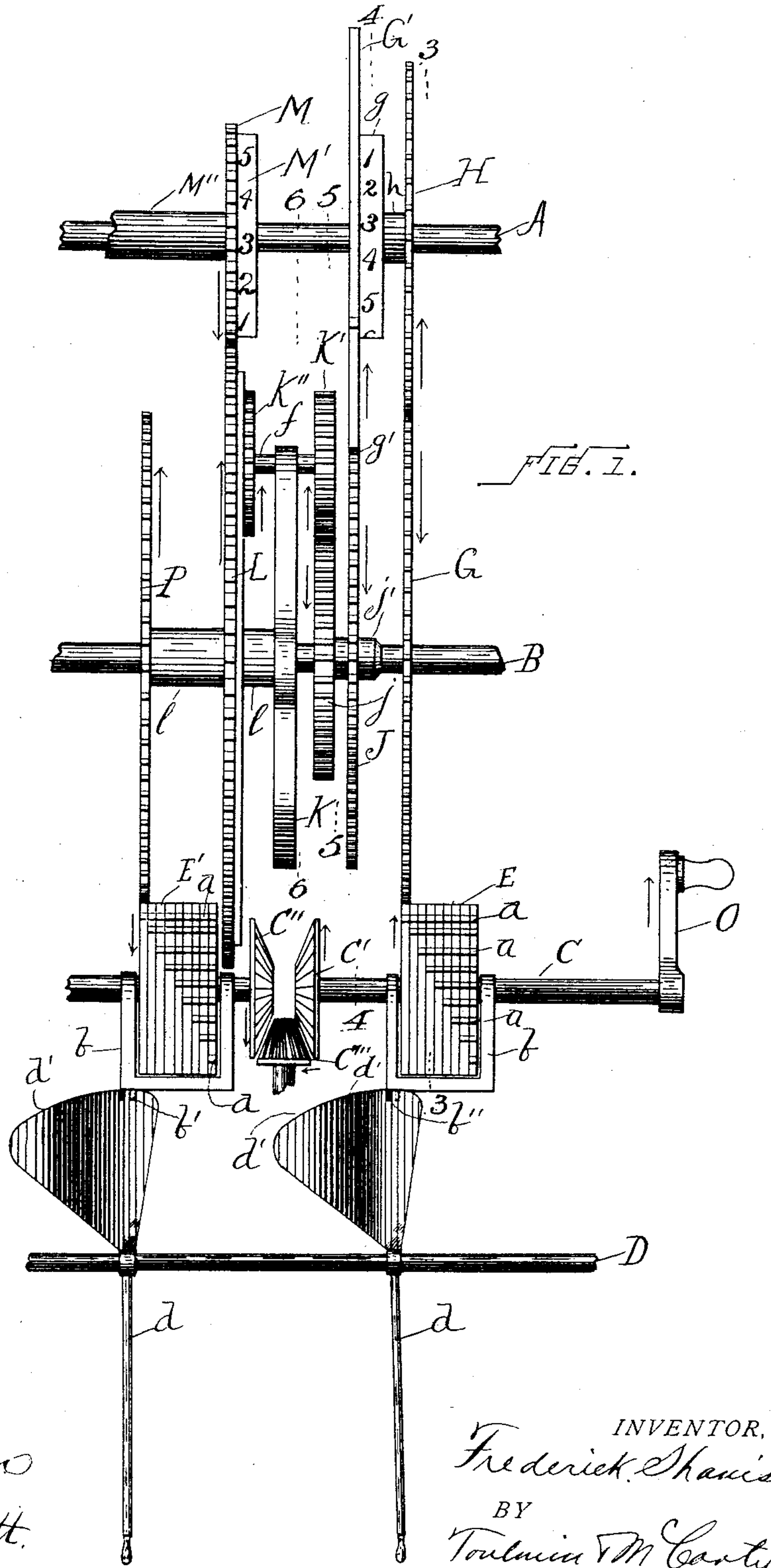
4 Sheets—Sheet 1.

F. SHANISEY.

ADDING MACHINE.

No. 510,522.

Patented Dec. 12, 1893.



WITNESSES:

John A. Hollen

Robert C. Douthitt.

INVENTOR,

Frederick Shanisey.

BY

Toulmin & McCarty

ATTORNEYS

THE NATIONAL LITHOGRAPHING COMPANY, WASHINGTON, D. C.

(No Model.) 4 Sheets—Sheet 2.

F. SHANISEY.

ADDING MACHINE.

No. 510,522. Patented Dec. 12, 1893.

Fig 2.

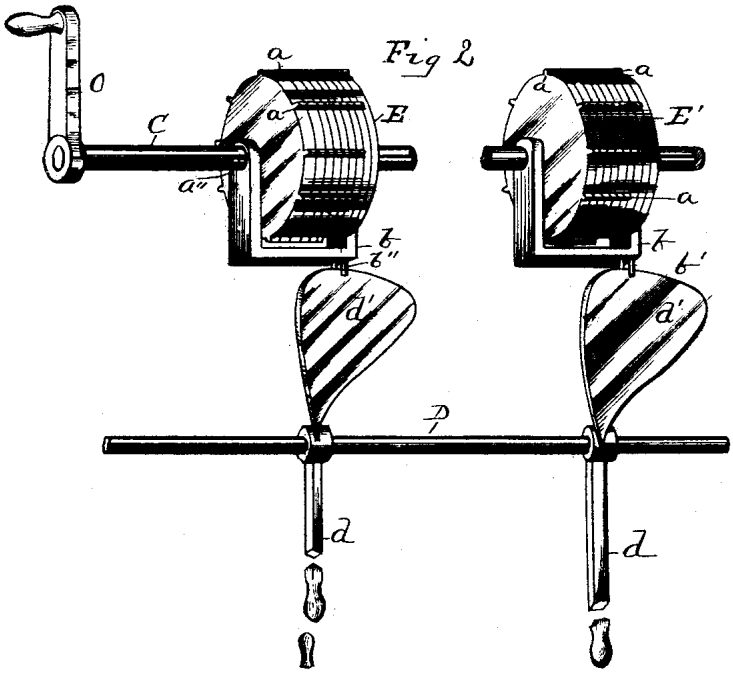


Fig 10.

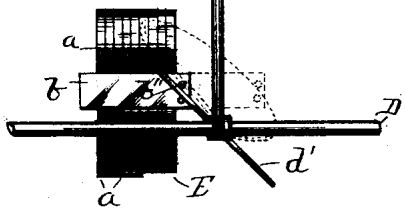


Fig 11.

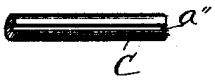
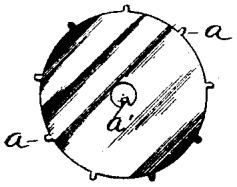


Fig 12.



WITNESSES:

L. C. Leoty.

Robert C. Douthitt.

INVENTOR

Frederick Shanisey

BY

Toulmin & McCarty

ATTORNEYS

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

(No Model.) 4 Sheets—Sheet 3.

F. SHANISEY.

ADDING MACHINE.

No. 510,522. Patented Dec. 12, 1893.

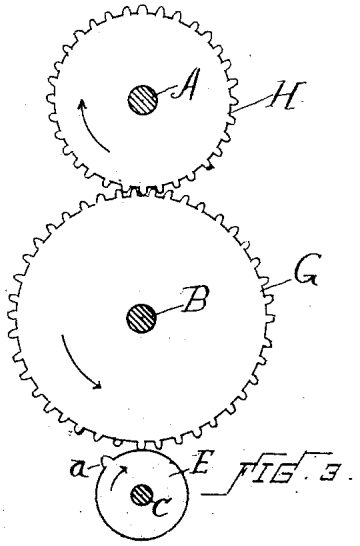


FIG. 3.

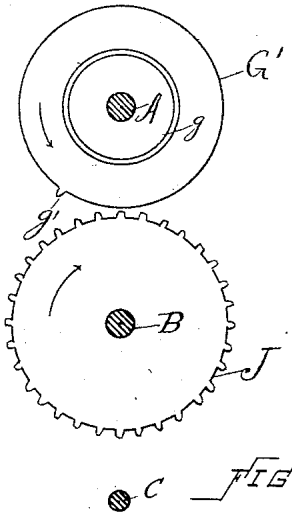


FIG. 4.

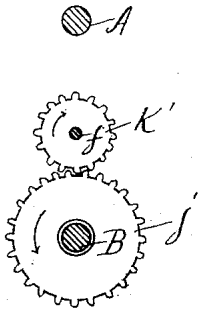


FIG. 5.

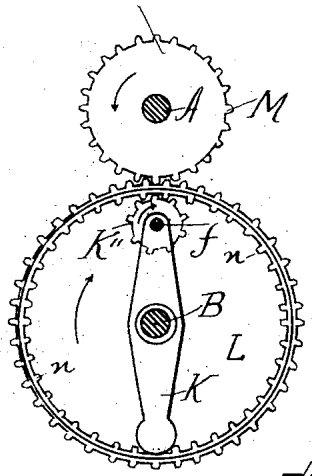


FIG. 6.

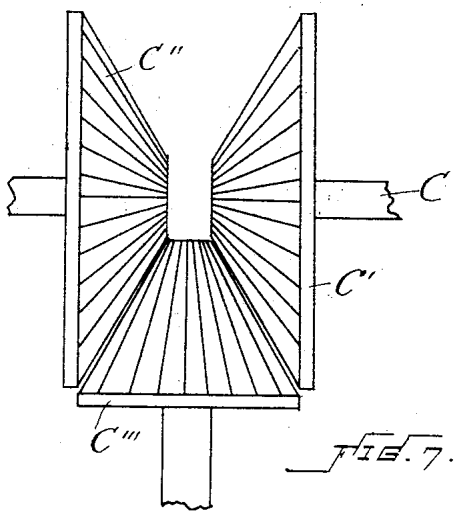


FIG. 7.

WITNESSES:
John A. Hiller
Robert C. Douthitt.

INVENTOR
Frederick Shanisey
BY
Toulmin & McCarty
ATTORNEYS.

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

(No Model.)

4 Sheets—Sheet 4.

F. SHANISEY.

ADDING MACHINE.

No. 510,522. Patented Dec. 12, 1893.

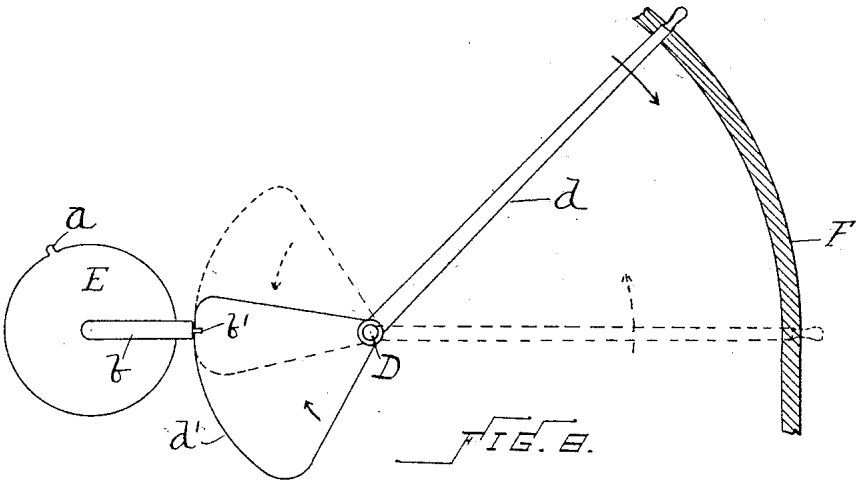


FIG. 8.

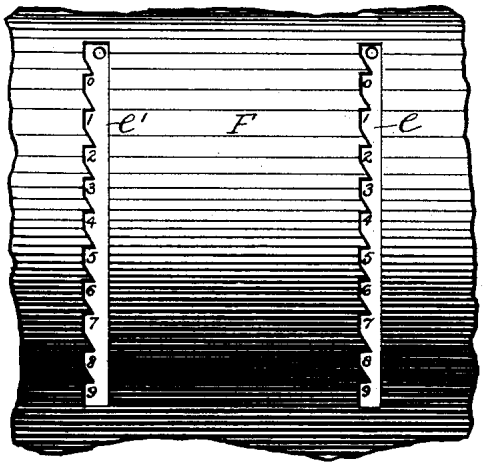


FIG. 9.

WITNESSES:
John A. Keller
Robert C. Douthitt

INVENTOR,
Frederick Shanisey.
BY
Toulmin & McCarty.
ATTORNEYS

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FREDERICK SHANISEY, OF DAYTON, OHIO.

ADDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 510,522, dated December 12, 1893.

Application filed December 15, 1892. Serial No. 455,321. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK SHANISEY, of Dayton, county of Montgomery, State of Ohio, have invented a new and useful Improvement in Adding-Machines, of which the following is a specification.

My invention relates to improvements in adding machines.

The object of the invention is to furnish accurate mechanical means for adding any series of figures which is done by the employment of mechanism that will be hereinafter fully described.

The improvements have reference to a system of toothed wheels associated in a manner to obtain special results; to one or more series of disks having teeth representing digits from one to nine, and to means for bringing said disks on a line with a gear wheel to be rotated a distance corresponding with the teeth on said disks.

The principle embodied in my invention, though associated in the present instance with an application for Letters Patent, as a means for adding numerals, is not alone susceptible of such use, but may be used for various other purposes—such for instance, as increasing the amount of gearing in various ways, that different work may be done at the same time, and independently of each other, from a single primary source of power; or it may be used as a means for conveying power to a drilling machine in a way enabling the speed being regulated so as to prevent the breakage of drills. It affords also an advantageous use as a changeable gear for a bicycle, and in a word, its use may be available in any connection where two powers are required to act separately or conjointly upon a third body, imparting to said third body a power equal to one of them, if one power is used, or equal to their sum if two or more powers are applied at the same instant.

For a detailed description of my invention reference is now made to the accompanying drawings forming a supplement to the specification.

The same reference characters on said drawings will indicate the same or corresponding parts wherever found.

Figure 1 is a plan view of my adding machine; the casing or inclosing parts it has not been thought necessary to show; Fig. 2, a detached, detail view showing the levers and disks, the inclined end of said levers occupying a position between the pins on the rectangular frame that incloses the disks; Fig. 3, an end view of the mechanism on the line 3—3 of Fig. 1; Fig. 4, a similar view on the line 4—4 of Fig. 1; Fig. 5, a similar view on the line 5—5 of Fig. 1; Fig. 6, a similar view on the line 6—6 of Fig. 1; Fig. 7, an enlarged detail view of the bevel gears; Fig. 8, a detached, detail view in side elevation of one of the levers, one of the disks, and the rectangular frame; Fig. 9, a front view of the casing with parts broken away; vertical slots are shown therein with notches bearing numerals corresponding to the number of teeth on the respective disks; Fig. 10, an enlarged elevation of one of the series of disks, showing the inclined end of the lever between the pins on the carriage or frame, *b;* the dotted lines represent the position of the lever blade, and the disks when the lever is depressed; Fig. 11, a detached detail view of a portion of the shaft C, showing the groove therein; Fig. 12, a detail view of one of the disks showing the axial opening in which the shaft C is journaled.

A, B, C, and D represent respectively, supporting shafts for the various wheels and other mechanism; these shafts with the exception of the shafts C and D, are immovable, and are journaled in the sides of the cabinet or housing that incloses the parts.

E and E′ are the units and tens sets of disks, each set numbering nine disks, and each disk having a tooth or teeth *a*, on the periphery thereof, representing digits from one to nine. The disks in the series E, rotate in a different direction from those of series E′ by the use of bevel gears C′, C″, C‴. The disks of each series are maintained in close proximity one to another by the rectangular carriage or frame *b*, which is provided with pins *b′ b″;* between these pins the inclined blade *d′* of the disk-setting lever *d* is adapted to move and thereby cause to be shifted back and forth on the shaft C, the series E and E′. This lever *d* as will be observed is fulcrumed on shaft D in the front part of the casing F; the handle thereof is adapted to move up and down in vertical slots *e* and *e′;* in this move-

ment, the inclined blade d' works between the pins b' and b'' on the disk frame or carriage b as before stated, to move the respective disks the required distance to bring the desired disk in a position to gear with wheels G or P. The slots e, e' are provided with a series of notches, each notch having a number corresponding with the number of teeth on the disks from one to nine, into which the lever may be locked.

An intermediate gear wheel G, having its fulcrum on shaft B is adapted to gear with any of the teeth on the disks of the units series E and with the gear wheel H on shaft A; adjacent to this wheel H, and fixed thereto by means of an integral sleeve h, is a gear wheel G' carrying a register wheel g. Wheels H, G', and register wheel g with the sleeve h, revolve upon their shaft, as do in fact all the wheels, upon their respective shafts, and combined, the wheels named constitute the units system.

Wheel G' is provided with a tooth g' on its periphery which tooth is designed to engage with the teeth of a wheel J mounted on the shaft B, and by this means the units are conveyed from the units register wheel g, when there are more than nine units to be registered. Wheels j and J rotate together on the shaft B by reason of their being integral parts of the sleeve j'.

K represents an arm fulcrumed on the shaft B, at one end of which arm a gear wheel K' of reduced dimensions, and a gear pinion K'' are fulcrumed on a shaft f journaled in said arm. The teeth of the wheel K' mesh with those of the wheel j. An internal and external spur wheel L (see Fig. 6) is fixed to sleeve l adjacent to wheel K'' in a manner to admit of the teeth of the wheel K'' engaging with the internal teeth n, of wheel L, thereby rotating the latter wheel which in turn meshes with gear wheel M on shaft A. The "tens" register wheel M' and sleeve M'' are integral with the wheel M and therefore rotate together by the action of the wheel K''.

P designates a gear wheel that meshes with the "tens" series E' of toothed disks. This wheel is fixed to the sleeve l, to which wheel L is also fixed, and when wheel P is rotated by the teeth a of said disks, naturally imparts to wheel L the same motion, independently of that motion which may be conveyed to said wheel L through the medium of the wheels G, H, G', J, j, the pinion K'', and the wheel K'.

The several arrows in Fig. 1 indicate the direction in which the respective wheels and disks rotate.

For the purpose of illustrating and describing the principle embodying my invention, I have shown in the drawings mechanism sufficient to complete one transfer, *i. e.*, from the units registering wheel g to the "tens" registering wheel M'. It is apparent that this transferring operation may be carried to a greater extent, for instance from tens to thousands and so on from a lower to a higher numerical order, by the employment of additional wheels.

The operation of my invention in the accomplishment of the objects herein described is as follows: Example—Say for instance 53 and 29 are to be added together; the units disks of series E are set at 3, and the "tens" disks of series E' at 5. The crank O is then turned one revolution, and the result is 3 is indicated on the register wheel g, while 5 appears on the register wheel M'; then the units disks of series E are set at 9, and the "tens" disks of series E' at 2. The crank O is again turned, and this completes a revolution of the register wheel g, which will register 2, and the tooth g' on said register wheel will move the wheel J one tooth, thus transferring 1 to the register wheel M' at the same time the "tens" series E' registers 2, thus making 8 appear on register wheel M', while 2 appears on g, the wheels g and M' registering 82, namely the sum of 53 and 29.

I have shown in the drawings, each series of disks E and E' consisting of nine disks containing teeth from one to nine, that is to say, one disk has one tooth, another has two teeth, and another has three teeth, and so on up to the ninth disk which is provided with nine teeth. An additional disk may be added to each series to represent zero, at which they may be set prior to being used, but this is not essential as the entire series may be carried out of line with their respective gear wheels, which would be equivalent to setting them at zero. It will be understood that each individual disk of both series is mounted independently of the rest, but are maintained in close proximity to each other by the frame b. In order that these disks may have a horizontal movement on the shaft C, and also be subjected to a rotary movement with said shaft, the center opening of the disk may be provided with a tooth a' similar to the teeth a, on the periphery, projecting from the axial opening to engage with a longitudinal groove a'' in the shaft. See Figs. 11 and 12. As before stated the horizontal movement of the disks is imparted thereto by the inclined blade end of the lever operating on the carriage or frame b as is seen in Figs. 2 and 10. The fulcrum of this lever being at a fixed point on the shaft D the frame b, and its respective set of disks must necessarily slide horizontally when the inclined blade is made to travel through the pins; the extent of said movement corresponding to the degree of the incline.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an adding machine, the combination of the levers having an end terminating in blades d' d', the several disks of the series E and E' provided with teeth as described, a rectangular frame inclosing each of said series having pins between which the lever blades move thereby subjecting the frame and

disks to a horizontal movement, substantially as and for the purposes specified.

2. In an adding machine, the combination with the casing having vertical slots with notches in the sides thereof bearing numerals from one to nine, of levers adapted to be locked in said notches, said levers terminating at one end in inclined blades, disks of the series E and E′ having teeth representing units of a higher and lower order, rectangular frames inclosing said disks, and subjected therewith to a horizontal movement by the depression or elevation of the lever which thereby causes the inclined blade to move between pins on said frame to slide the same, substantially as and for the purposes specified.

In testimony whereof I have hereunto set my hand this 6th day of December, 1892.

FREDK. SHANISEY.

Witnesses:

GEORGE H. WOOD,

EDWARD G. PEASE.