C. F. BONNER & J. H. DAVISON.

Registering-Machines.

No. 150,462. Patented May 5, 1874.

Fig. 1.

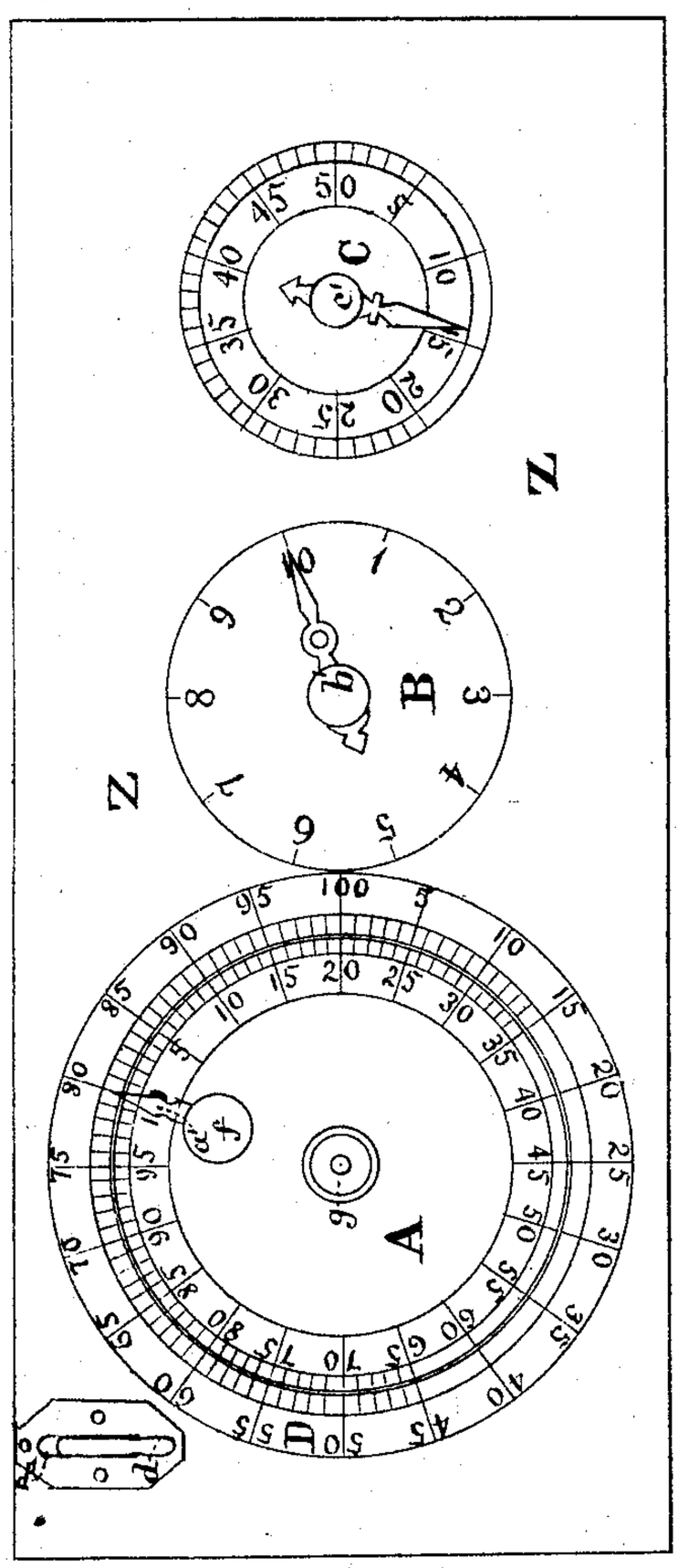


Fig. 2.

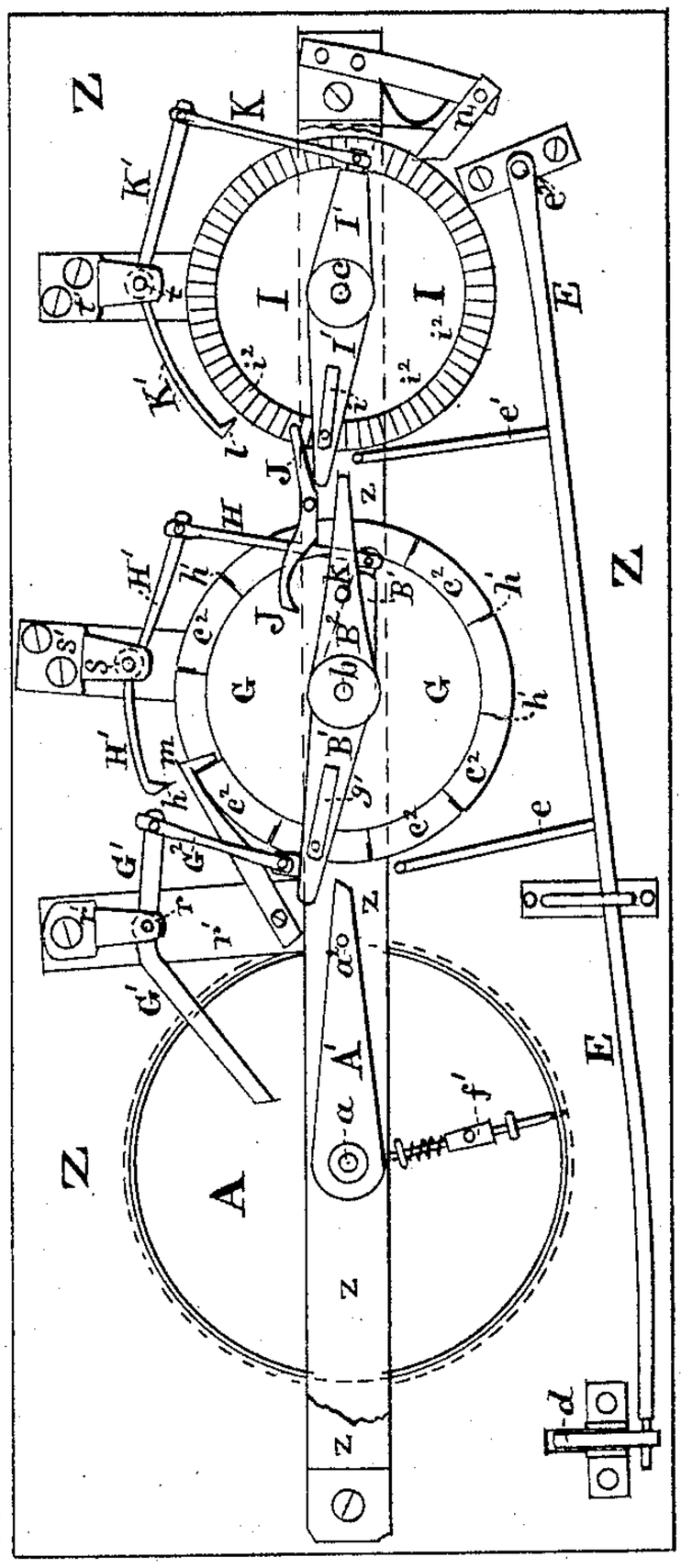
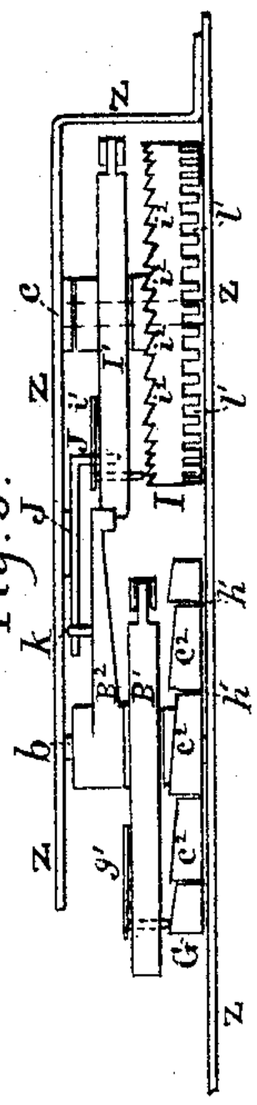


Fig. 3.



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UNITED STATES PATENT OFFICE.

COLUMBUS F. BONNER AND JAMES H. DAVISON, OF GREENCASTLE, PA.

IMPROVEMENT IN REGISTERING-MACHINES.

Specification forming part of Letters Patent No. **150,462**, dated May 5, 1874; application filed March 11, 1874.

To all whom it may concern:

Be it known that we, COLUMBUS F. BONNER and JAMES H. DAVISON, both of Greencastle, in the county of Franklin and in the State of Pennsylvania, have invented a certain new and useful Calculating and Self-Registering Tally; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The nature of our invention consists in the construction of a calculating and self-registering tally, by means of three numbered dials and an annular disk provided with a system of coacting levers, and two revolving notched disks provided with indicators, spring-catches, and ratchets, as will more fully hereinafter appear.

To enable others skilled in the art to make and use our invention we will proceed to more specifically describe its construction and operation.

In the drawings, Figure 1 is a front view; Fig. 2, a rear view, showing the internal arrangement; and Fig. 3 a detail side view of our invention.

Z is a wooden board about half an inch thick, to which the mechanism is attached and fitted in any suitable case, as a whole; but there are fastened to this wooden frame Z metallic frames *z r′ s′ t′*, in which are the bearings for arbors *a*, *b*, *c*, *r*, *s*, and *t*, to which the principal parts of the internal works are secured. A, B, and C are circular metal plates or dials, the first one fixed on arbor *a*, with which it rotates, and fitting in a corresponding opening in frame Z. The other two dials are made fast to this frame, and are stationary. D is an annular metal plate or disk permanently attached to frame Z, and encircling the opening therein, fitted by dial A, and is, with dials A, B, and C, made flush with the face of frame Z. The dial A and disk D each contain a hundred points, with every fifth point numbered in Arabic numerals, and these numbers on these dials represent units, and are continuously watched in making the calculations below one hundred. Dial B has numbers from 1 to 10, and the hand b' on arbor *b* automatically points to said numbers with each revolution of dial A—*i. e.*, registers every hundred counted by dial A. Dial C contains fifty points, with every fifth point marked with Arabic numerals, and the hand c^1 on arbor *c* automatically registers on this dial every ten hundred, or thousand, counted or registered by dial B at each of its revolutions. Instead of dial C only registering fifty thousand, it might be made to register millions. On dial A, at number 100, there is made fast a hand or indicator, a^1, for pointing or registering the numbers on disk D, as desired. Near hand a^1, and projecting from the rear side up through the face of dial A, is a knob, *f*, by which this dial is rotated, which knob is the handle to spring-bolt *f′*, (see Fig. 2) on the rear side of dial A, that locks into a recess in frame Z in the rear of disk D, there being a recess for each unit or point on disk D, and it is by bolt *f′* shooting into one of said recesses that hand a^1 of dial A is held at any desired number on disk D. The end of arbor *a* projects out from the face of dial A, as knob *g*, to serve as a fulcrum for the thumb when the forefinger pulls knob *f* to unlock bolt *f′*, preparatory to and while turning dial A. A′ is the main or driving lever fast on the center of arbor *a*, with which it revolves. This lever acts on lever B^1 with its outer end, and on lever *d′* with its pin a^2. Lever B^1 oscillates on arbor *b*, and works levers G^1 and G^2, and, with said levers, lever A, and spring-catch *g′*, moves the notched disk G and hand *b′*. It also operates levers H and H′, and detent *h*, to lock disk G and hand *b′*, after each registration of a hundred. On and near the center of arbor *b* is firmly set lever B^2, which acts with its outer end on lever I′, and on lever J (which is pivoted at its center, as shown in Fig. 3) with its pin *k*. Lever I′ oscillates on arbor *c*, and works lever J in connection with lever B^2, and, with levers J and B^2 and spring-catch i^1, actuates the notched disk I and hand c^1. It also operates levers K and K′ and detent *l*, to lock disk I and hand c^1 after each registration of a thousand. Lever G^1 oscillates with its arbor *r*, lever H′ with its arbor *s*, and lever K′ with its arbor *t*, as clearly indicated in Fig. 2. The spring-catches *g′* and i^1 are, respectively, secured on levers B^1 and I′, and each is constructed of a flat spring secured at one of its ends on the rear side of its

lever, and provided with a bolt or catch at the loose end of the spring that projects through a hole in its lever to act on wheels G and I, respectively. (See Figs. 2 and 3.) The short lever *d*, projecting through the frame Z, in which it is pivoted, is connected on the rear side of frame Z with one end of shifting-lever E, which is provided with rigid arms *e* and e^1, and which lever E is pivoted at its other end at e^2, Fig. 2. By turning lever *d* to the opposite side of the slot *d'*, (shown in Fig. 1,) the lever E will be moved so that its arms *e* and e^1 will, respectively, act on levers B^1 and I', and so cause detents *h* and *l* to let go their holds on disks G and I, thereby permitting us to quickly reset hands *b'* and c^1, or to count thousands with hand c^1 without moving hands a^1 or *b'*, or to count hundreds with hand *b'* without moving hand a^1.

The mechanism having been constructed and arranged as above shown, the lever *d* with lever E is placed in the position illustrated in Figs. 1 and 2, and the machine having been set with the hands a^1, *b'*, and c^1 at their starting-points—a^1 at number 50, *b'* at a distance half-way between 1 and 10, c^1 at number 100—the invention is thus operated: Place your thumb on one side of knob *g* on arbor *a*; then, with your forefinger of the same hand, pull the knob *f* toward arbor *a*, thereby unlocking bolt *f'* from the recess in which it was in frame Z in rear of number 100 on disk D, and permitting the dial A and hand a^1 to turn with the increase of numbers on disk D; the dial A is then turned with the thumb and finger on knobs *f* and *g*, until hand a^1 points to the number wanted less than a hundred on disk D, at which point the hold on the knobs is given up, and bolt *f'* springs into a recess under the number on disk D, at which hand a^1 was stopped. By continuing to turn dial A until hand a^1 has passed around to number 75 on disk D, the lever A' will just engage with lever B^1; and as lever A' with dial A turns until hand a^1 has passed on to 85 on disk D, lever A' will lift lever B^1 and force its spring-catch *g'* the length, and over one, of notches c^2 on disk G, and thus make the said catch *g'* catch on the notch next the one just left. At the same time lever B^1 thus acts in obedience to lever A' it also lifts lever G^2, which depresses lever G^1 a distance equal to the length of a notch, c^2. Lever B^1 at the same moment also pulls lever H, which pulls lever H', and so disengages detent *h* from one of the recesses *h'* in the periphery of disk G. As soon as hand a^1 passes the number 85 on disk D, the lever A' will disengage itself from lever B^1, and immediately pin a^2 on lever A' begin to act on lever G, and as lever A^1, with its pin a^2, passes on until hand a^1 is opposite 100 on disk D, the lever G^1, with levers G^2, B^1, H, and H', will describe movements opposite to those they described while hand a^1 was passing from 75 to 85 on disk D, as just described, and catch *g'* will press against the notch c^2, over which it had just been forced, and turn disk G the length of such notch, and the hand *b'* from its starting-point to 1 on dial B, thereby registering one hundred at the same moment hand a^1 registers one hundred on disk D. When catch *g'* has executed this movement, detent *h* has also been forced into a recess, *h'*, beyond the one just left, and spring-ratchet *m* has caught the notch c^2 next to the one it last held. This co-operation of the levers and parts of the dials A and B is continuous, the hundreds being automatically registered as they are made from revolution to revolution of dial A; and, when ten hundred have been nearly registered on dial B—*i. e.*, hand a^1 passed around to number 97 on disk D, and hand *b'* nearly to number 10 on dial B in the tenth hundred—lever B^2 on arbor *b* will engage with lever I' on arbor *c*, and then catch i^2 on lever I' is lifted half-way the length of a notch, i^1, as the hand a^1 passes round disk D past the 100-mark thereon, and so counted the last of the thousand; but the hand a^1 is still turned, until, by the time it reaches 75 on disk D, the levers A', B^1, B^2, and I' are in train; then, from 75, hand a^1 passes on to 88 on disk D, and when it has reached said point the levers A', B^1, and B^2 will have so acted on lever I' as to have forced its catch i^2 the remaining half-way over the notch i^1, (also, lifted from recess *l'* the detent *l* on lever K', and raised lever J;) and then, as hand a^1 progresses from 88, the lever B^2 will leave lever I' and at once begin with pin *k* to engage with lever J, and cause it, with levers K and K', to describe motions the reverse of those they described while the hand a^1 was passing from 75 to 88 on disk D, and catch *i* will press against the notch i^2, over which it had just been forced, and so turn disk I the length of such notch, and the hand c^1 from its starting-point (50 on dial C) to number 1 on said dial, thereby registering one thousand before another hundred will have been registered either on dial A or B. When catch *i* has executed this motion detent *l* has been forced into one of the recesses *l*, next to the one it was in before it was moved, and the ratchet *n* catches in the recess *l'*, next to the one it was in before disk I moved. This co-action of hands a^1, *b'*, and c^1 is continuous—when hand a^1 has made a revolution hand *b'* has made one-tenth of a revolution, when hand *b'* has made a revolution hand *c'* one-fiftieth of a revolution.

The foregoing gives a description of the internal operation of the invention, but the external operation, and that which need only be known and observed when using the invention, is as follows: Having set the machine, say that you want to register twenty-five. To do this, turn the dial A around until the hand a^1 points to 25 on disk D, and you have registered the number. Then, suppose to this number twenty-five you desire to add thirty-five more; look for the number 35 on dial A and you will find opposite this number on disk D the number 60, which is the addition you

want mechanically performed, and you then turn hand a^1 to 60 on disk D. Should you desire to add seventy to the answer just obtained, look for 70 on dial A and you find opposite on disk D the number 30; now turn hand a^1 around to said 30, and, as it passes the 100-mark on disk D, a hundred will be registered by hand b' on dial B, and the addition and self-registration performed. If the sum added amounts to thousands, the answer will be respectively read from dials C, B, and A something like this—40,000, 700, 82, as the equivalent of 40,782.

The object of our invention is to calculate and self-register the number of stamps sold in a post-office, the number of bushels of grain, &c., received at a warehouse, or the number of feet of lumber, shingles, staves, boards in a pile, &c., at a lumber-mill; or dials B and C represent dollars, and disk D cents, in any business requiring such tally.

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

1. The revolving numbered dial A, with pointer a^1, and spring-bolt f' for locking the dial at any desired point, in combination with the annular numbered disk D, for calculating and registering any number up to one hundred.

2. The system of coacting-levers, A′ with pin a^2, B^1 G^1 G^2 H H′ B^2 I′ with pin k, J, K, and K^1, for the purpose of actuating the notched disks G and I, with arbors b and c, provided with pointers b' and c^1, constructed substantially as set forth.

In testimony that we claim the above-described certain new and useful calculating and self-registering tally we have hereunto signed our names this 7th day of March, 1874.

C. F. BONNER.
J. H. DAVISON.

Witnesses:
WM. F. PATTON,
JOHN TALHELM, Sr.