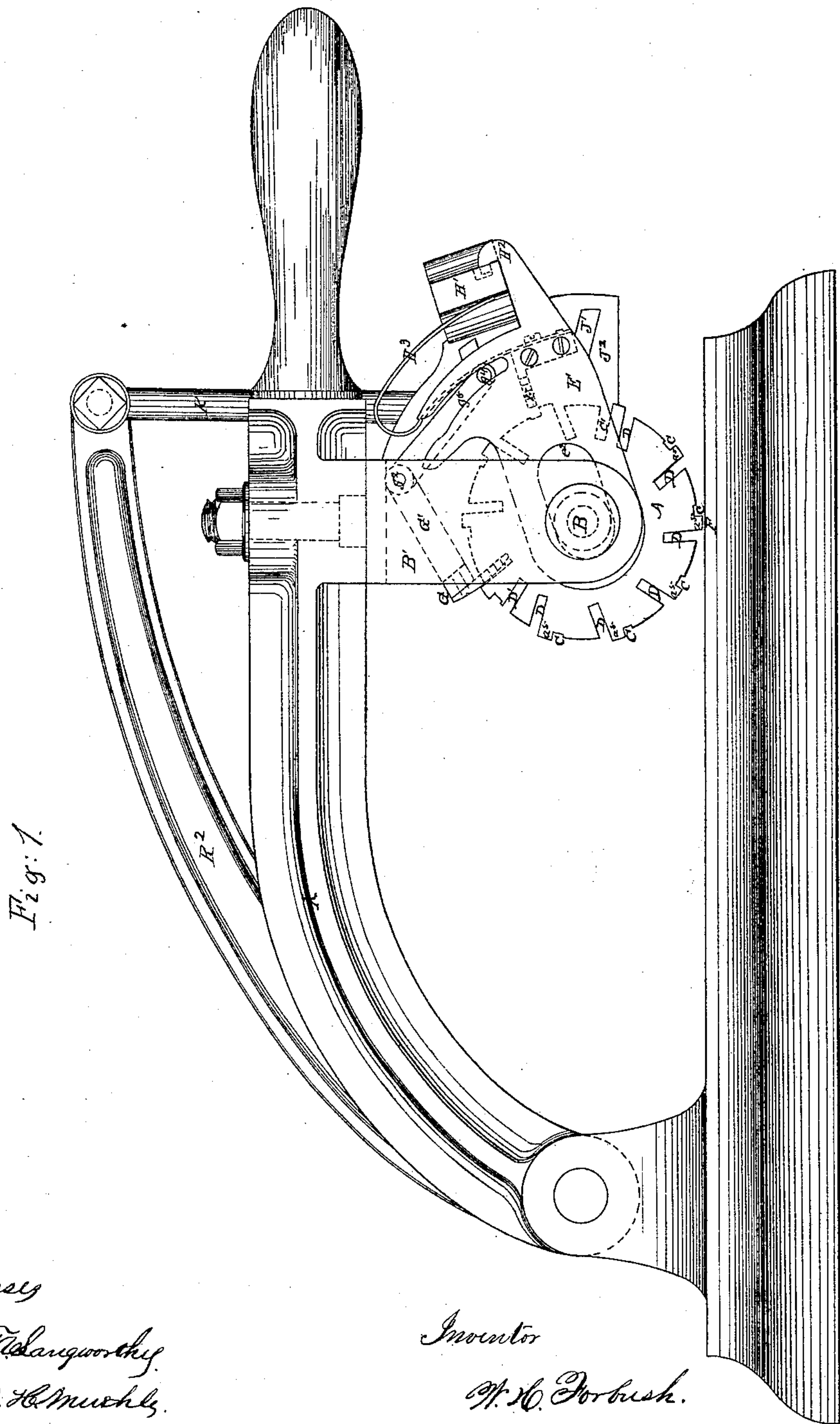


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NUMBERING AND PAGING MACHINE.

No. 73,963.

Patented Feb. 4, 1868.



Witnesses

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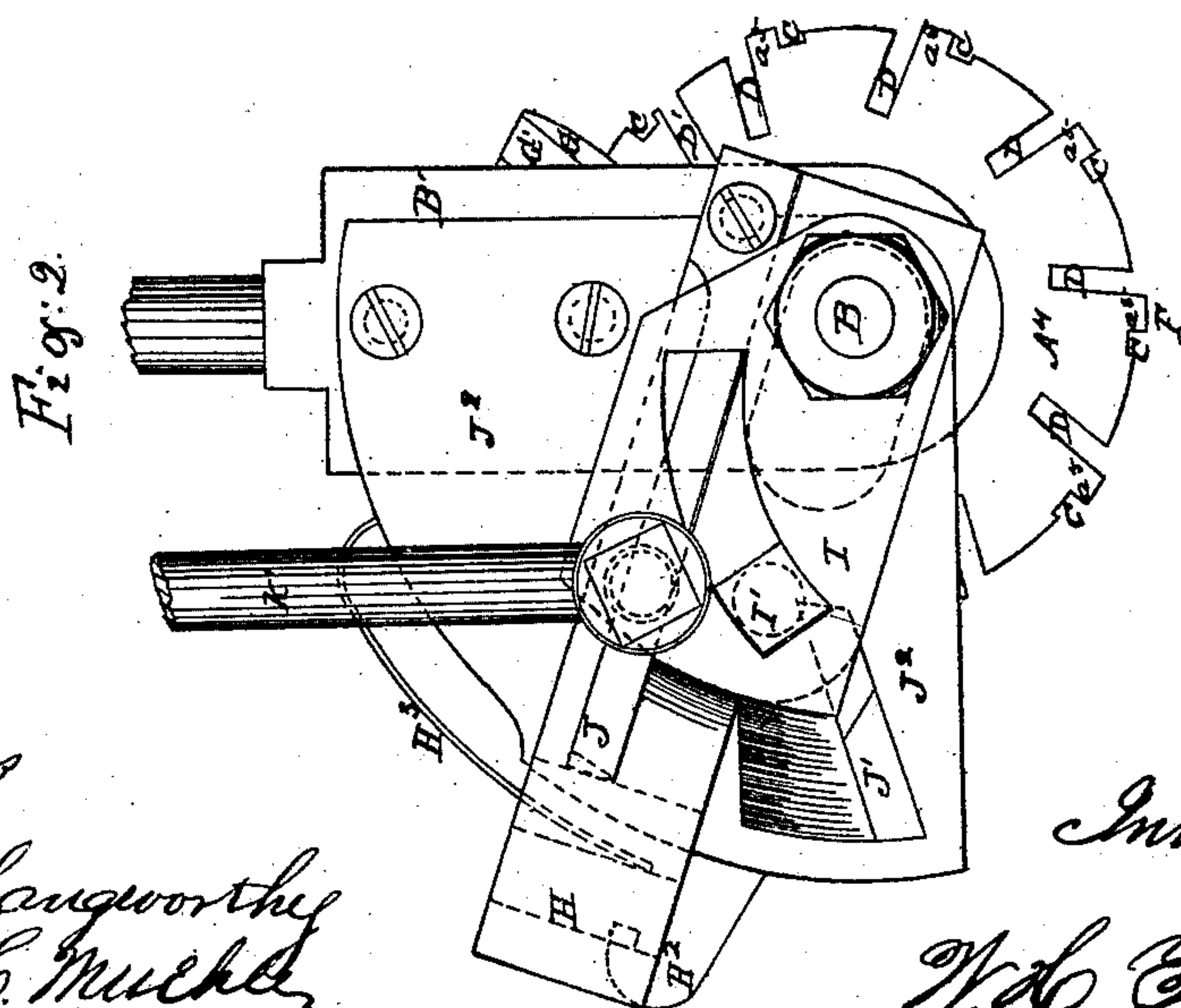
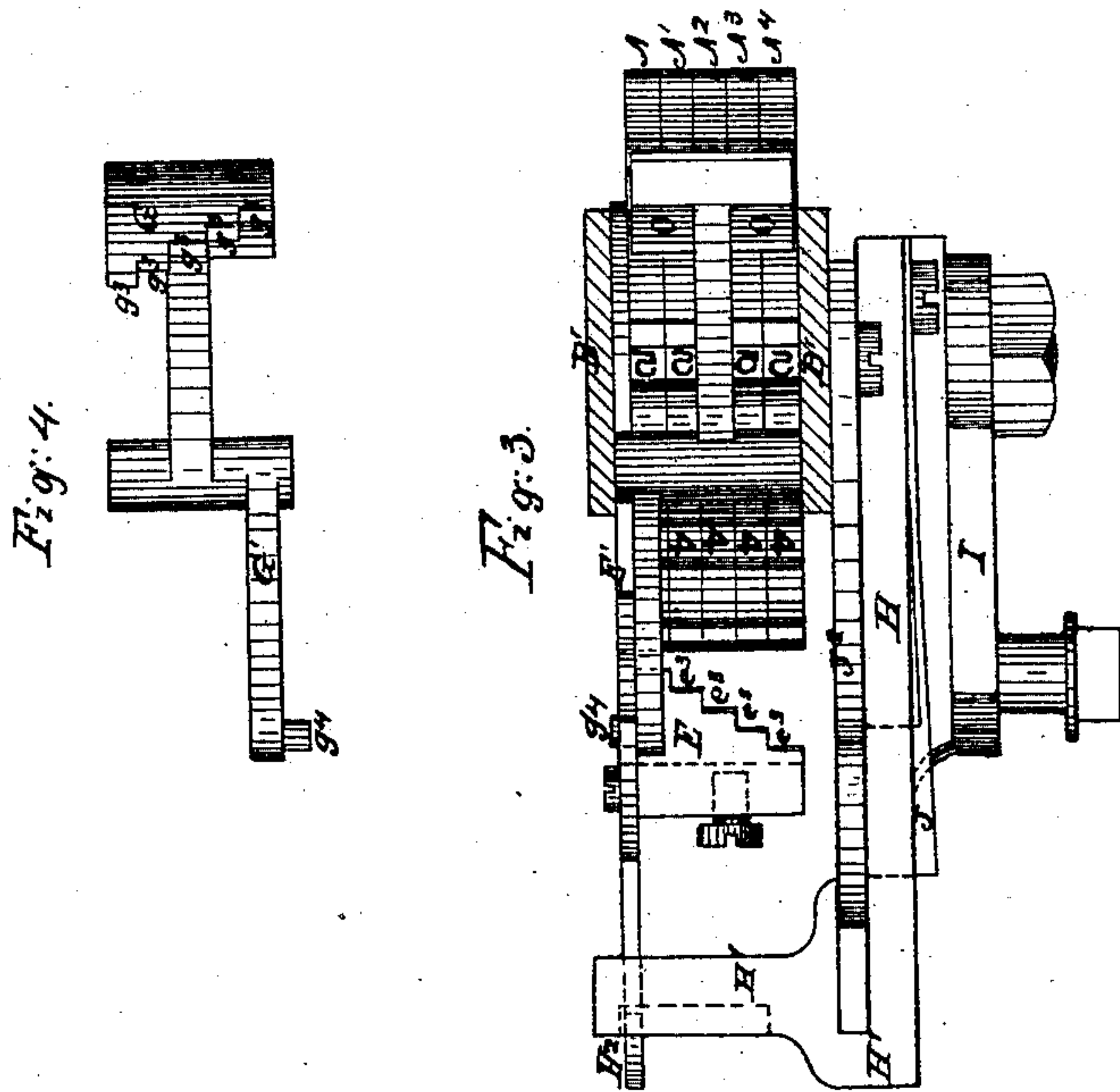
Inventor

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United States Patent Office.

WALTER H. FORBUSH, OF BUFFALO, NEW YORK.

Letters Patent No. 73,963, dated February 4, 1868.

IMPROVEMENT IN NUMBERING-MACHINES.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, WALTER H. FORBUSH, of the city of Buffalo, county of Erie, and State of New York, have invented certain new and useful Improvements in Numbering or Paging-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification.

The nature of this invention consists, first, in the application, to the rotating wheels or disks of a numbering-machine, of a registering-bar or pawl, striking radially, or nearly so, into a series of external registering-notches, cut in said wheels, said pawl being raised out of said notches just before, and striking therein just after each movement or change of the numbering-disks, thereby bringing the figured faces of the several disks into perfect register or alignment; second, constructing the registering-pawl with a system of steps, when the same is made to work in combination with a pawl, giving motion to the numbering-disks, by a system of steps similar but reversed, so that when this movement-pawl engages the first or unit-disk, the register-pawl releases both, and so on throughout the series of disks constituting the numbering-machine, the registering-pawl always entering and holding all of the disks after each change; third, in the construction of certain mechanism for giving the requisite movements to the disk-changing pawl. In the accompanying drawings—

Figure I is a side elevation of my improved numbering-machine.

Figure II is a reversed side elevation, showing mechanism for operating disk-changing pawl.

Figure III is a sectional plan, and

Figure IV detail view of registering-pawl.

Like letters represent like parts in each of the figures.

A A¹ A² A³ A⁴ represent the wheels or disks comprising the machine, each disk having ten projecting arms, *a*⁵, upon which are engraved successively the nine digits and cipher. They are arranged side by side, upon a shaft, B, in a frame, B¹. The left-hand disk A is the units' disk, the next, A¹, the tens', the next, A², hundreds', and so on through the series. The disks have two sets or series, of ten each, of external notches cut in them, the one set, lettered C, being shallow, and for the changing-pawl to work in. One of this set of notches, lettered C', is cut deeper than the rest, for purposes which will hereafter appear. The other set, lettered D, including a half notch, D', are all cut deep, the same as C', and are for the registering-pawl to work in. E represents the changing-pawl, by the engagement of which with the notches C, the required movements are given to the disks. This pawl is connected to a side plate or arm, E', hung at its inner end upon the shaft B, and slotted, as shown at *e*², so that the pawl may be given an inward radial movement, to engage the notches C of the disks, an ensuing downward movement concentric with the disks, sufficient to carry the disks forward one-tenth of a revolution, an outward radial movement to withdraw the pawl from the notches, and an upward movement to return it to the starting-point. The mechanism for producing this in, down, out, and up movement of the pawl will be described further on. The entering edge of the pawl is cut into a series of steps, *e*³, the first step, or highest, being in line with units' disk, the next step in line with tens' disk, the next with hundreds' disk, and so on. The height of each of these steps is a trifle greater than the depth of the notches C, and the height of all combined just equal to that of the deep notch C'. Owing to this arrangement of the steps, when the inward movement of the pawl is directed to either of the shallow notches C, of the units' disk, the first step will engage said units' disk, and it only, so that only the units' disk will be carried around in its ensuing downward movement, but when it is directed to the deep notch C' of the units' disk, it may enter farther, and cause its second step to engage the tens' disk, and so carry both the units' and tens' disks forward. And in like manner, when the deep notch of the units' disk is in line with the deep notch of the tens' disk, it may enter still farther, and cause its third step to engage the hundreds' disk, and so carry both units', tens', and hundreds' disks forward, and so on through the whole series of disks. Now, since each disk has only one of the deep notches, C', it follows that the units' disk must make nine movements, one-tenth of a revolution each, before the pawl will engage and move the tens' disk, and that the tens' disk must make nine movements before the pawl will engage and move the hundreds' disk, and so through the series. The relative position of the deep notches to the line of figures recording the movements of the disks, in this case shown at F, must be such that

they will be in position to receive the pawl when the figures 9 reach said line, so that the ciphers will come into said line with the recording figure of the next higher disk. For instance, when the 9 of the units' disk reaches this line, its deep notch must be in position, so that the pawl will engage the tens' disk, and in bringing the 0 of the units' disk into place, bring also the digit of the tens' wheel, recording the number of tens the units' disk has counted.

Having thus described the operation of the changing-pawl, I will now describe the registering-pawl in its combined operation therewith.

G represents the registering-pawl, attached to one arm of a lever, G', which is hinged to the frame B', at a point, g^2 , so located that the pawl may strike radially, or nearly so, into the registering-notches D. The entering edge of this pawl has a system of steps, g^3 , similar to those of the changing-pawl E, but reversed in position, that is, the lowest step entering the units' disk, the next higher step the tens' wheel, and so on. The registering-notches are of such depth that the pawl may strike into them until its lowest step enters and holds the units' disk. The other arm of the lever G' extends towards the changing-pawl, and has a stud-pin, g^4 , entering a slot, g^5 , in the side plate E', to which the changing-pawl is attached, so that the inward and outward movements of the changing-pawl are communicated to the registering-pawl, whereby, when the changing-pawl enters the units' disk, the registering-pawl is raised out therefrom, so that the units' disk may take its forward movement, upon completion of which the registering-pawl drops into the next notch and holds the units' disk until it is again released by the movement of the changing-pawl. In like manner the engagement of the changing-pawl with the units' and tens' disks, or units', tens', and hundreds' disks, &c., will raise the registering-pawl therefrom and release them for their forward movement. It thus follows that the registering-pawl releases such disks as are engaged by the changing-pawl, but retains its hold upon all the others, so that at all times the two pawls together have positive hold of all the disks, and that the registering-pawl, after each movement of the disks, strikes through the whole series, and brings them into perfect register and alignment. A half notch, D', is provided for the register-pawl, so that all of the wheels not required for the commencing figure may be set out of line with the recording place, they being brought into place by the action of the changing-pawl, as will be readily understood.

The mechanism for effecting the in, down, out, and up movement of the changing-pawl, is as follows:

H represents a radial arm, swinging upon the shaft B, and slotted the same as the side plate E'. This arm has a right-angled bend, H¹, at its moving end, to which the side plate E' is connected by the hook H², a spring, H³, being interposed between said bend H¹ and the changing-pawl. I represents a slotted cam, on the shaft B, at the side of the arm H, which arm carries the stud I', working in the slot of the cam, so that a downward movement of the cam draws the arm H inwardly, until the upper end of the cam-slot strikes the stud, when the inward movement of the arm is changed to a downward movement. The upward return movement of the cam first throws the arm outwardly, until the bottom of its slot strikes the stud in the arm, and its outward movement is changed to an upward movement to the starting-point. The arm is held and guided in its inward and outward movements by a spring-pin, J, striking into notches J¹, and in a fixed plate, J², said notches being in such position as to cause the changing-pawl, as it receives movement from the movement of the arm, to properly enter and leave the notches in the disks.

The in and out movement of the arm is uniformly sufficient to cause the changing-pawl to engage all of the disks, when their deep notches come together, so that the changing-pawl will always be carried into the notches of one or more of the disks, or until it strikes the bottom of a notch, when the yielding of the interposed spring H³ will allow the arm to complete its inward movement. This numbering-mechanism being attached by its frame B' to a vibrating-arm, K, or to the reciprocating cross-head of a printing-press, and a connection made by the rod K¹ from a permanent arm, K², with the cam, each upward movement of the arm K will cause the cam to give the in and down movement to the arm H, and through it to the changing-pawl, to operate the disks, while each upward movement of the arm K will give the return out and up movement to said parts. By a duplication of the arm H, cam I, and fixed plate J², the bend, H¹, being extended and connecting the two arms H together, any desired number of independent machines, secured to a cross-head in line with each other, as is common in presses for printing and numbering coupon railroad-tickets, and between said arms, may be operated at the same time by simply hooking the side plates E' of each one into the bar H¹.

Having thus described the construction, and operation of my invention, what I claim, and desire to secure by Letters Patent, is—

1. A registering-pawl, G, striking radially, or nearly so, into the external registering-notches D of the disks, after each movement thereof, thereby bringing said disks into strict alignment.
2. The system of steps, g^3 , on the registering-pawl G, working in combination with the steps of the changing-pawl E, substantially as set forth.
3. The mechanism, consisting of the cam I, arm H, and fixed plate J², or the equivalent thereof, for giving the in, down, out, and up movement to the changing-pawl E, as and for the purpose set forth.

W. H. FORBUSH.

Witnesses.

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